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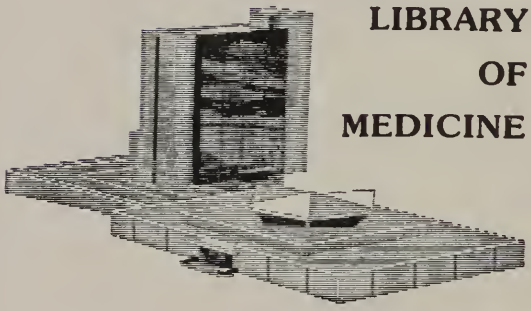

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A CLINICAL REPORT OF OPERATIVE SURGERY IN THE SERVICE OF DR. WILLIAM T. BULL

AT THE NEW YORK HOSPITAL
DURING OCTOBER AND NOVEMBER, 1889, AND FROM FEBRUARY TO JUNE, 1890

BY
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LATE HOUSE SURGEON

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A CLINICAL REPORT OF OPERATIVE SURGERY IN THE SERVICE OF DR. WILLIAM T. BULL,

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During October and November, 1889, and from February to June, 1890.

By WILLIAM B. COLEY, M. D.,
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The large number of abdominal cases possessing points of unusual interest and importance that occurred during this period gave rise to the idea of publishing a short history of the cases which should contain all the salient features.

An effort has been made to avoid verbosity on the one hand without sinking to the level of mere statistics on the other.

The original intention of including only abdominal cases was subsequently abandoned, and when the interest seemed sufficient to warrant, other cases have been given in more or less detail, the ordinary cases being summarized or tabulated in order to make the report as complete as possible.

The main classification has been made upon an anatomical basis as regards the *field* of operation, while the various subdivisions have reference to the different pathological conditions present.

The total number of operations was 326. Of these, 75 were performed upon the abdomen, 45 upon the head, face, and neck, 37 upon the thorax, 26 upon the rectum and anus, 58 upon the genito-urinary organs, 28 upon the upper extremities, 46 upon the lower extremities, and 11 miscellaneous.

The total number of deaths was 18, or a mortality of 5·5 per cent. Of the 18 fatal cases, 11 belong to the miscellaneous abdominal cases, in many of which the patients were *in extremis* at the time of operation.

Among the important abdominal cases may be mentioned a pylorectomy and gastro-enterostomy for large carcinoma of the stomach, followed by recovery, the patient being alive and well nine months after the operation; and an abdominal section, with recovery, in two cases of acute and septic peritonitis, general.

Anæsthesia.—Ether was used in 305 cases, chloroform in 12, and cocaine in 9. The preference was given to chloroform in children and in the abdominal cases in which the patients were already weak and suffering from more or less shock at the time of operation. In every case the chloroform gave satisfactory results, and the anæsthesia was followed by much less nausea and vomiting than when ether was used.

OPERATIONS UPON THE ABDOMEN.

There were seventy-five operations upon the abdomen, with a total mortality of 18·4 per cent.

Of this number, ten were for cystic disease of the ovaries or broad ligament, with no deaths. Thirty-five were for hernia of different varieties, with two deaths. In both fatal cases the operation was done for prolonged strangulation, and in one case (very large strangulated umbilical) the complication of diabetes and advanced chronic parenchymatous nephritis existed.

Although the miscellaneous cases, twenty-three in num-

ber, show the high mortality of 47·8 per cent., many of the patients were *in extremis* at the time of the operation.

A careful analysis of these cases shows the causes of death to have been as follows:

In three cases death was due to acute intestinal obstruction, in all of which peritonitis had already developed before operation, and in one case there was the additional complication of a fracture of the spine and femur.

Peritonitis following cholecystotomy in two cases, and hæmorrhage and shock following operation for large abscess of left lobe of the liver in one case, caused three deaths.

The remaining fatal cases are: One pistol-shot wound of the abdomen, when immediate laparotomy was performed with the hope of arresting dangerous internal hæmorrhage, but the patient died almost as soon as the abdomen was opened; one death from hæmorrhage and shock following nephrectomy for advanced tuberculosis of the kidney; one death following laparotomy for advanced tubercular salpingitis and peritonitis; one death from peritonitis following operation for recurrent perityphlitis; and one death from septic general peritonitis caused by a suppurating adenoma of the ovary.

OPERATIVE METHOD.

In all the operations upon the abdomen the general plan pursued may be summarized as follows:

Preparation of the Patient.—For two or three days preceding the operation the bowels were mildly purged and the diet carefully regulated. In some few cases, where the operation was to be long and the conditions were favorable for serious shock, free stimulation, either by the mouth or by the rectum, was resorted to. The field of operation was carefully cleansed with soap, water, and ether several hours before the operation, and a large wet dressing of 1-to-2,000 bichloride-of-mercury solution applied.

Antisepsis.—The instruments were always boiled for half an hour or more just previous to the operation, and during the operation were kept in a tray containing either boiled water or a 1-to-1,000 solution of hydronaphthol. The sponges were kept in boiled water, and no antiseptics were used during the operation. The abdomen was irrigated only in those cases where there was some special indication. The abdomen was opened eleven times without the use of drainage, and warm water was employed to wash out the abdomen in about half the cases. A small amount of 1-to-10,000 bichloride-of-mercury solution was used in a few cases where peritonitis was already advanced.

Drainage.—The glass tube was used in almost all cases where drainage was needed, but in several cases, especially where there was any tendency to oozing from broken adhesions, a tampon of iodoform gauze was inserted alongside the tube and allowed to remain from twenty-four to forty-eight hours.

Abdominal Suture.—The peritonæum was sutured with a continuous catgut suture, the muscles with catgut interrupted sutures, and the skin by a separate line of interrupted silk sutures.

After-treatment.—As soon as the patient was taken to the ward, if there was any evidence of shock, the body was surrounded with hot-water bottles, and hot water and whisky were given by the rectum. During the first twenty-four hours nothing was given by the mouth except a little hot water or cracked ice. In most cases very little, if any, morphine had to be given. On the second day liquid food in very small quantities was given. The drainage-tubes were removed on the second or third day. The sutures were taken out from the eighth to the tenth day.

On the fourth day, earlier if tympanites was present, the bowels were freely moved by small and frequently re-

peated doses of Rochelle salts. In a few cases, where the operation was followed by pain in the abdomen accompanied by some rise in temperature, the ice-coil was applied, and in almost every case the symptoms quickly subsided.

Complications.—In one case the adhesions were so very extensive that dangerous hæmorrhage ensued a few hours after the operation. The wound was partially reopened, without anæsthesia, and a very large tampon (several yards) of iodoform gauze introduced. This controlled the hæmorrhage, but a few days later a fæcal fistula appeared at the wound and remained open three weeks, finally closing spontaneously.

In one case, in cutting through the parietal peritonæum, the intestine, which was slightly adherent beneath the line of incision, was wounded for a distance of an inch and a half. The opening was quickly closed with silk sutures. The patient made a good recovery. In another case, where the adhesions had become numerous and well organized (a case of tubercular peritonitis and salpingitis), the autopsy showed a small perforation of the bladder, with escape of urine.

In a fourth case, one of acute intestinal obstruction, no cause for obstruction could be found at the operation, but a very careful examination at the autopsy revealed a fracture of the spine in the lower dorsal region with no displacement. This had evidently caused intestinal paralysis, but had caused no other symptoms.

All the operations were performed in the amphitheatre, and after the operation the patients, with a few exceptions, were taken to the general wards.

NEOPLASMS.

Cystic Tumors of the Ovary ; Complicated Cases.—The main points of importance in the cases belonging to this class will be found summarized in the accompanying table.

A few of the cases deserve special mention. Of these, the first was a case of colloid cysts of the ovaries with salpingitis.

Case I.—The patient was a women twenty-eight years old, married, but had never borne children; she had had several miscarriages. Her general health was good up to within a year previous to admission, when she had an attack of pelvic peritonitis; since then she had had two or three recurrent attacks with an increase in severity. She was admitted in November, 1889. Nothing could be felt in the abdomen externally, but, by vaginal examination, a mass of about the size of an orange could be felt on either side of the uterus. The uterus itself was moderately fixed.

Operation, November 20, 1889.—The contents of the pelvis were firmly matted together by old, organized adhesions. On the right side, in the region of the ovary, was found a cyst of about the size of an orange and filled with colloid material. In the same region on the left side there was a somewhat larger cyst, containing clear yellow serum. The ovaries could not be recognized, but the tumors, along with the Fallopian tubes, were removed. The hæmorrhage from broken adhesions was considerable, but controlled by cautery and iodoform tampon, which was introduced alongside of the glass drainage-tube. The operation was followed by severe shock, but the patient made a good recovery. The glass tube was taken out at the end of twenty-four hours, and the iodoform tampon two days later. A sinus remained at the site of the tube, and has resisted several subsequent attempts to close it. The pathologist's report showed that ovarian structure was present in the masses removed. Four weeks after the operation the patient began to menstruate, and has continued to do so at regular intervals since.

Case II. *Multilocular Cyst of the Ovaries; Rapid Enlargement; Loss of Flesh and Strength; Conditions simulating Malignancy.*—The patient was a woman fifty-three years of age, married, and the mother of four children. She had been well up to within a year previous to entering the hospital, when she first noticed pain in the right iliac region. Three months

later a swelling appeared in the same locality, and increased steadily in size. The loss of flesh and strength was rapid and progressive. For the last six weeks there had been symptoms of pressure upon the bladder and rectum, together with a bloody discharge from the uterus. For nearly a year menstruation had been slightly more frequent than usual, and more profuse, and recently had shown considerable odor.

At the time of admission the lower portion of the abdomen was occupied by a spheroid tumor, smooth, fluctuating, slightly more prominent on the right side, and extending three inches above the umbilicus. By the vagina the cervix was felt low down and abnormally hard. Douglas's *cul-de-sac* was filled with a hard, smooth mass, apparently solid.

Operation, March 1, 1890.—The tumor proved to be a large cyst filled with chocolate-colored fluid (20 litres). The cyst was multilocular, and evidently had originated from the right ovary.

On the left side, behind and below the uterus, was found a second cyst, of the size of a child's head, so tense that it strongly simulated a solid tumor. Unlike the former, it contained clear yellow fluid (30 ounces). It was firmly adherent to the sigmoid flexure, and considerable hæmorrhage resulted from separation of the adhesions. The glass tube was left in the abdomen for six days; quite a large amount of fresh blood was withdrawn from the tube the first three days, and the pulse ranged from 120 to 140. The wound healed primarily and the sinus quickly closed; but at the end of two weeks she had a sharp attack of local peritonitis. A small mass of omentum had been tied off during the operation, and this was undoubtedly the cause of the trouble. A hard, very tender mass, intraperitoneal, could be felt three inches above the umbilicus. The patient made a good recovery. In August (five months after the operation) she was again seen. She still complained of severe pain in the region of the uterus, and had a constant bloody discharge, with marked odor. A careful examination revealed undoubted evidence of carcinoma of the cervix, thus explaining the earlier symptoms, as the disease had evidently coexisted with the ovarian trouble.

Case III. *Very Large Multilocular Cyst of the Left Ovary; Right Ovary removed for Cystic Tumor Nine Years before;*

Laparotomy ; Hæmorrhage after Operation arrested by a Large Iodoform Tampon ; Recovery ; Fæcal Fistula with Spontaneous Closure.—J. B., sixty-one years of age, widow, always well. Nine years previous to admission a large cystic tumor was removed. Ventral hernia soon after appeared in the cicatrix. Three years later a swelling appeared in the left ovarian region. This steadily increased in size and was attended with considerable pain and discomfort.

Examination.—Abdomen greatly enlarged (measuring forty-eight inches at the umbilicus). An old cicatrix seven inches long was seen in the median line, and just to the right of this an old hernia of the size of a man's head. The whole abdomen, with the exception of the uppermost part, was dull, and fluctuation was distinct.

Operation May 9, 1890.—An incision six inches long was made in the median line, disclosing a large multilocular cyst of the left ovary, containing thirty litres of clear yellow serum, and everywhere adherent to the parietal peritonæum and the viscera. The adhesions could only be separated with the greatest difficulty, and at the risk of considerable hæmorrhage. An attempt to enucleate the cyst-wall was only partially successful. A pedicle was finally obtained, attached to the broad ligament; this was transfixed and ligated with heavy silk. The ovary could not be recognized. The hæmorrhage could not be entirely checked, but, as the patient's condition was poor, it was thought best not to prolong the operation. A large iodoform gauze drain was left in the pelvis in addition to the glass tube. Two hours after the operation fresh blood began to come from the tube and drain, and the patient showed well-marked constitutional signs of hæmorrhage. The abdominal wound was opened (without anæsthesia) and a large square piece of iodoform gauze was pushed into the bottom of the cavity. Within this, as a receptacle, several smaller pieces were introduced. This controlled the hæmorrhage. The gauze was allowed to remain three days and was then gradually removed. On the sixth day a fæcal fistula appeared. This remained open three weeks, and then closed spontaneously. The patient made a good recovery.

CASE IV.

Case IV. *Large Multilocular Cyst of the Ovary; Laparotomy; Recovery.*—A. G., thirty-five years of age, entered the hospital in June, 1890, with a tumor of the abdomen of five years' duration, steady increase in size, and unaccompanied by pain. She had been tapped ten days previous to admission and eighty pounds of clear yellow fluid withdrawn. On her entrance, the abdomen was greatly distended and the intestines were crowded up into the region of the ensiform cartilage.

Operation, June 19, 1890.—A median incision fourteen inches long was made. A large multilocular cyst was found, attached by old and firm adhesions to the ensiform cartilage above and to all the abdominal viscera. The cyst had evidently started in the left ovary. There was considerable hæmorrhage, but it was controlled. The glass drainage-tube was taken out at the end of twenty-four hours. The abdominal wound healed by perfect primary union. On the eighth day (at the first dressing) the intestines were still in the upper portion of the abdomen, and the anterior abdominal wall was in contact with the spine. During the third week there was a mild attack of intestinal obstruction lasting a few days. The intestines slowly regained their natural position and the abdomen its normal shape.

The patient was discharged cured August 13th.

Case V. *Cystic Adenoma of the Ovary; Laparotomy; Recovery.*—The patient, twenty years of age, had been married two years before; had had no children, but one miscarriage (at four months) a year previous to her admission. Three months and a half before she had had the left tube and ovary removed for oophoritis. After the operation, pain and tenderness began in the region of the right ovary, and she came to the hospital for the relief of pain. Examination showed the uterus movable and the cervix high up. On the right side a small, tender mass was felt which was supposed to be an enlarged ovary.

Operation, March 19, 1890.—The right ovary and tube were found bound down by adhesions. They were both removed; the ovary was but slightly enlarged and contained a number of small cysts. No drainage was used. Primary union and prompt recovery from the operation followed, but the pain continued with but slight relief.

Diagnosis and date of operation.	Sex, age, condition.	Previous history.	Condition at time of operation.	Operation.	Wound healing and complications.	Result.	Drainage and irrigation.	Remarks.
1. Ovarian cyst, multilocular. Nov. 2, 1889.	F., 54; married.	Well until 1 yr. ago; rapid enlargement of abdomen; loss of flesh and strength; children.	Whole abdomen greatly distended; symmetrical spheroid tumor; fluctuation.	Median laparotomy, 3½-inch incision; two large cysts attached to ovaries removed with ovaries; contents, color of chocolate and gelatinous in consistence.	Primary union; tube taken out end of 24 hours. Uninterrupted recovery.	R.	Drainage and irrigation.	
2. Colloid cysts of ovaries with salpingitis. Nov. 20, 1889.	F., 28; married.	Well until 1 yr. ago; three attacks of pelvic peritonitis during past year; no children.	Nothing felt by abdominal palpation. Vaginal examination: two firm masses, size of an orange, one on either side of uterus.	Median laparotomy, 4-inch incision; contents of pelvis firmly matted together by old adhesions; two small colloid cysts, along with tubes and ovaries, removed; considerable hæmorrhage.	Severe shock followed operation; tube removed at end of 24 hours. Good recovery, but persistent sinus remained.	R.	Glass and iodoform drainage.	Sinus not closed 1 yr. after operation. Menstruation began 1 mo. after operation, and has since occurred regularly.
3. Cystic ovaries. Feb. 1, 1890.	F., 38; married.	Past 9 months menstruation irregular, and severe pain in ovarian region.	Abdominal examination negative; *per vaginam*, two small masses felt, one on either side of uterus; tender.	Median incision, 3½ in.; both ovaries slightly enlarged and containing small cysts; ovaries and tubes both removed.	Primary union. Prompt recovery from operation; but pain but little relieved.	R.	No irrigation; no drainage.	Patient seen several months later, and pain still severe.

Diagnosis and date of operation.	Sex, age, condition.	Previous history.	Condition at time of operation.	Operation.	Wound healing and complications.	Result.	Drainage and irrigation.	Remarks.
4. Cystic ovaries and dilated Fallopian tube. Feb. 8, 1890.	F., 21; married.	Pain and tenderness in left ovarian region, 1 yr.; right ovarian region, 3 mos.; irregular menstruation; no children.	Tenderness over both ovarian regions. Vaginal examination: two small, tender masses, apparently in right and left broad ligam'ts.	Median incision, 3½ in.; ovaries cystic and slightly enlarged. One tube dilated; no pus in tube. Tubes and ovaries removed. Small intestine wounded, 1½ in.; closed with silk sutures.	Second day, temp. 102·4°; abdomen moderately distended and tender. Ice-coil and saline cathartic; small and frequent doses. Good recovery.	R.	No irrigation; no drainage.	Primary union.
5. Multilocular cyst of ovaries; simulating malignant tumor. March 1, 1890.	F., 54; married.	Family history good; pain in right iliac region, 1 yr.; tumor, 9 mos.; rapid loss of flesh and strength in 3 mos.; children.	Symmet. spheroid tumor 3 in. above umbilicus; cervix hard; Douglas's *cul-de-sac* filled with hard, apparently solid tumor.	Median incision, 4 in.; attached to right ovary was a cyst containing 20 litres chocolate-colored fluid; left side behind and below uterus was a cyst size of a child's head, very tense and hard. Contents: clear, yellow serum.	Consid. hæmor. followed separation of adhesions, and fresh blood was removed from tube for 3 days. Pulse, 120–140. Tube left in for 6 days.	R.	Glass drainage.	Small piece of omentum was tied off during operation, and at end of 2 weeks stump evidently became inflamed.
6. Cyst of broad ligament. March 8, 1890.	F., 29; married.	Always well; 8 mos. ago tumor appeared in lower portion of abdomen; no pain; menstruation regular; no children.	Abdomen symmetrically enlarged; circumference at umbilicus, 41 in.; fluctuation.	Median incision, 3 in.; contents of cyst removed through trocar. Pedicle attached to right broad ligament; left ovary and tube undisturbed; right ovary and tube removed.	Primary union. Patient sitting up 14th day.	R.	No drainage; no irrigation.	Hard, tender mass above umbil.; temperature, 101°. Patient had well-marked signs of cancer of cervix, 6 mos. later.

7. Ovarian cyst, multilocular. April 8, 1890.	F., 28; married.	Always well; increase in size of abdomen noticed, 1 yr.; pain of late; no children.	Tumor symmet.; fluctuating; occupying lower portion of abdomen as far up as umbil.	Median incision, 3 in.; cyst of right ovary, containing 1 litre of reddish-brown fluid, found; left ovary enlarged and cystic. Both ovaries and tubes removed.	Recovery good, but somewhat delayed by a stitch-hole abscess.	R.	Glass drainage; no irrigation.	
8. Ovarian cyst, very large, multilocular. May 9, 1890.	F., 61; married.	Right ovary removed for cystic tumor 9 yrs. before; 6 yrs. ago tumor appeared on left side; children.	Ventral hernia, size of a man's head, at site of old cicatrix; whole abdomen greatly enlarged; tense and fluctuating.	Six-inch median incision; cyst wall firmly adherent throughout entire extent. Adhesions separated with great difficulty. Cyst contained 20 litres fluid, clear; cyst wall, ovary, and tube removed.	Two hours after operation signs of hæmorrhage. Wound opened, and large iodoform gauze tampon introduced; controlled bleeding.	R.	Irrigation; glass and iodoform drainage.	Sixth day a fæcal fistula appeared at site of tube; spontaneous closure at end of 3 weeks.
9. Ovarian cyst, multilocular. June 19, 1890.	F., 35.	Five years ago abdomen began to increase in size, gradual enlargement since; no pain; no children.	Ten days before operation cyst tapped, and 80 lbs. of chocolate-col'd fluid withdrawn.	Median incision, 14 in. long. Large multilocular cyst adherent to ensiform cartilage above and to all the viscera. Adhesions separated with difficulty.	Perfect primary union; 3d week obstinate constipation, lasting a few days. Discharged cured, 50th day.	R.	Irrigation and glass drainage.	
10. Cystic adenoma of ovary. March 19, 1890.	F., 20; married.	One year ago pain and tenderness in left ovarian region; left tube and ovary removed 3½ mos. before; pain in right ovary since.	Tender mass in right ovarian region felt *per vaginam*.	Median incision; tube and ovary adherent; removed. No drainage, no irrigation.	Perfect primary union; prompt recovery.	R.	No drainage; no irrigation.	Pain but slightly relieved.

CARCINOMA OF THE STOMACH.

Case I. *Exploratory Laparotomy; four weeks later, Pylorectomy and Gastro-enterostomy; Recovery.*—This case having already been reported at length by Dr. Bull himself at the New York Academy of Medicine and published in the *Medical Record*, a brief sketch will here suffice. The patient was a woman, twenty-seven years of age, born in Ireland, and had been in good health up to within eleven months of the time of entering the hospital. She then began to have attacks of nausea and vomiting. These symptoms continued increasing in frequency, and four months before the operation a "lump" was noticed in the epigastrium. This was freely movable and was somewhat painful, the pain being sharp and shooting in character. There had been no vomiting of blood, nor had she ever noticed blood in the stools. She had lost flesh and strength rapidly during the last two months, and her face was markedly anæmic. In the epigastric region there was a tumor two inches and a half by four inches and three quarters in vertical and transverse diameters, rising and falling with respiration. It was freely movable to the right as far as the outer border of the right rectus muscle, and to the left to the normal position of the kidney; free hydrochloric acid was absent in the stomach. On March 8, 1890, an exploratory laparotomy was performed, disclosing a large neoplasm, evidently carcinomatous in character, occupying the pylorus and a large portion of the greater curvature of the stomach. As the removal of the growth would necessitate such an extensive operation, with a prognosis at best doubtful, it was thought wise to defer it until the nature of the tumor, as well as the risk attending its removal, had been explained to the patient.

The exploratory wound quickly healed. After careful deliberation the patient decided to undergo a second operation, and accordingly she returned to the hospital on April 4th.

She was kept in bed three days. No special preparation was carried out beyond restricting the diet and keeping the bowels loose. The stomach was not washed out previous to the day of the operation, and liquid food was given up to the morning before the operation. Just before the operation she was

given four ounces of strong black coffee and an ounce of whisky by rectum.

Second Operation, April 7, 1890.—As soon as the patient was anæsthetized, the stomach was washed out with boro-salicylic acid by means of a stomach tube. A five-inch median incision was made. The omentum was slightly adherent in the line of the old incision. The greater and lesser omenta were then separated from the portion of stomach to be removed. The duodenum was then cut across just below the pylorus and the distal end turned in and carefully sutured by a double row of silk Lembert sutures. A second transverse incision was made beyond the cardiac end of the new growth, and the proximal end was treated in the same manner as the duodenal except that the muscular layers were first roughly approximated by means of a continuous catgut suture. This left the portion of stomach remaining a blind pouch.

A coil of jejunum about twelve inches from the duodenum was then found and brought into contact with the anterior wall of the stomach. A gastro-enterostomy was then performed with Abbe's catgut rings in the usual way. This portion of the operation occupied only thirty minutes. The whole time the patient was under ether was three hours and a half. Her condition became very bad before the close of the operation, her pulse at one time being 204 and scarcely perceptible. Digitalis and hydrobromide of quinine given subcutaneously, and whisky with hot water by the rectum, revived her.

Two hours after leaving the ward she vomited a small quantity of bloody mucus. During the first twenty-four hours after the operation her condition was very critical, but from that time on improvement was steady and rapid. Her temperature was normal, but her pulse remained high for the first five days. No food by the mouth was allowed for three days, and after that only liquid and in small quantities. The patient was discharged cured on May 2d. She subsequently returned to her home in Ireland. Dr. Bull received a letter from her in January, 1891. She was well at that time.

Case II. *Laparotomy; Gastro-enterostomy; Death.*—The patient was a woman thirty years of age, and in good health

until eleven months previous to the operation. She then began to have nausea and vomiting, and afterward suffered rapid loss of flesh and strength. A tumor in the epigastrium had been observed a few weeks before her entering hospital. Examination showed considerable emaciation. The epigastric region was occupied by a tumor two inches by three inches and a half in diameter, hard, nodular, moving with respiration, and capable of being pushed up beneath the ribs, but less freely movable in a lateral direction. No free hydrochloric acid was found in the stomach.

Operation, May 10, 1890.—The stomach was washed out after anæsthesia, as in the preceding case. The neoplasm was found to involve so much of the stomach that its removal was not to be considered. It began near the pyloric extremity, occupied almost the entire lesser curvature, and extended well around to the greater curvature anteriorly. The stomach being much less freely movable than in the former case, it could not be drawn out of the abdominal wound, and the gastro-enterostomy which was performed was done under very great difficulties. The stomach wall was friable, and the sutures between the intestine and stomach repeatedly gave way. The stomach itself had not been completely emptied by the tube before the operation, and it required the utmost care to prevent any of the contents from getting into the abdominal cavity. The condition of the patient remained good throughout the operation, and she recovered from the shock which necessarily followed; but septic peritonitis rapidly developed, and she died at the end of thirty-six hours. The autopsy showed general peritonitis. The sutures had held perfectly.

Remarks.—In this case, doubtless, it would have been wiser to refrain from attempting intestinal anastomosis, the growth was so extensive and the condition so unfavorable for the success of such an operation. Had it proved successful, the prolongation of life would have been very trifling, if any.

Case III.—*Exploratory Abdominal Section; Recovery.*—The third case of malignant disease of the stomach subjected to

operation was that of a man forty-five years of age. He had been well until nine months before, when he began to have nausea and vomiting, and subsequently developed a characteristic history of cancer of the stomach. He had been unable to eat solid food for six weeks, had considerable epigastric pain, increased by the ingestion of food and relieved by vomiting, and loss of flesh had been rapid and progressive.

Exploratory incision, June 24, 1890, revealed a neoplasm extending from the upper part of the duodenum to the cardiac orifice. There were several enlarged glands in the omentum, and both excision and anastomosis were deemed impracticable. The patient made a rapid recovery, and suffered no harm from the exploration.

UTERINE FIBROIDS.

Case I.—E. C., thirty-eight (colored), married. General health always good; never pregnant; several attacks of pelvic peritonitis during the past six years; the last attack eighteen months before, since which time there had been a small tumor in the right iliac region; tender, movable at first, but gradually becoming more fixed; slowly increasing in size; considerable pain, sharp, shooting in character. Menstruation regular, but more profuse than normal. Admitted on October 15, 1889.

Operation, October 25, 1889.—Ether. Fundus of the uterus found enlarged; both ovaries cystic. Several fibroid masses, varying in size from that of a small egg to that of the fist, were found attached to the uterus, and bound by firm adhesions to the adjoining viscera. The adhesions were separated with difficulty, and the fibroid masses, together with both ovaries and tubes, were removed close to the body of the uterus, and the pedicles secured by heavy silk ligatures. Considerable hæmorrhage resulted from the separation of the adhesions, but it was controlled by means of the cautery. A glass and also an iodoform gauze drain were left in the wound, the former being taken out at the end of thirty-six hours, and the latter on the fourth day. The patient made a good recovery, but the sinus persisted, and when last seen, eight months after the operation, was two inches deep, just admitting a director.

CARCINOMA OF THE RECTUM.

Case I. *Inguinal Colotomy; Recovery.*—L. S., aged fifty-four, married, United States, general health good until recently. Three years ago he first noticed a small mass in the rectum about two inches above the anus. This slowly increased in size, and a year ago he began to have a bloody discharge from the rectum and the stools became flattened. The pain and bleeding had much increased during the past four months, and there had been moderate loss of flesh and strength.

Physical Examination.—The anus did not admit the finger until after gradual dilatation with bougies. Just within the anus a small mass was felt on the anterior wall of the rectum and extending up as far as the finger could reach.

Operation, October 30, 1889.—Inguinal colotomy. One finger in the rectum and another in the wound allowed the limits of the tumor to be made out. The growth appeared to be too extensive to warrant extirpation at a subsequent operation, which plan was at first entertained.

The gut was opened on the third day, and the patient suffered no bad effects from the operation. He left the hospital on November 28th, improved.

Case II.—M. F., aged forty five, married, general health good until two years ago, since which time there has been more or less blood in the stools. Eight months ago she began to have pain in the rectum, accompanied by marked constipation. Stools hard and flattened. Considerable loss of flesh and strength.

Physical Examination.—Lower portion of rectum normal. High up anteriorly there was felt a hard, smooth mass of about the size of an egg and somewhat movable.

Operation, May 30, 1890.—Median incision four inches below the umbilicus. A tumor of the size of a large hen's egg was found in the anterior wall of the upper portion of the rectum between the bladder and the rectum and involving the rectum to such an extent that removal would be impossible without destroying the continuity of the bowel.

A loop of the sigmoid flexure was then brought into the wound, and the wound was closed, leaving just enough open to

receive the portion of sigmoid flexure necessary for a colotomy. The gut was held *in situ* by means of a silver wire passed beneath it and fastened to the abdominal wall on either side, and the serous surfaces were held together by a few sutures of fine catgut.

The bowels were opened on the fourth day, and the patient left the hospital on January 16th, improved. She is living now.

UNCLASSIFIED CASES.

Case I. *Pyelonephrosis; Nephrotomy; Recovery.*—The patient, a woman thirty years of age, had been well up to within two years before entering the hospital. She had a perfectly characteristic history of pyelonephrosis, beginning with a severe attack of cystitis. Six months later she began to have sharp pain in the right lumbar region, and soon after noticed a swelling that could be felt anteriorly in the right iliac region. During the attack of pain, which lasted several days, the sediment in the urine became greatly increased in quantity and more purulent in character. She subsequently had a number of similar attacks, and the same changes in the urine were always synchronous with the pain and swelling.

There had been moderate loss of flesh and strength and she was anæmic.

Examination at the time of her admission showed a well-defined tumor, soft and semi fluctuating, occupying the right side of the abdomen from just below the border of the ribs nearly to the crest of the ilium. The urine contained one eighth per cent. (weight) of albumin and considerable pus.

Operation, November 16, 1889.—Lumbar incision. A cavity containing about two drachms of pus was found, evidently in the pelvis of the kidney. The wound discharged pus and urine. A sinus remained open when she left the hospital, three months later.

Case II. *Tubercular Pyelonephrosis; Nephrectomy; Death.*—E. H. (for previous history see above). Patient returned to the hospital March 26, 1890, the sinus having failed to close and the discharge being still profuse and containing urine. General

health greatly impaired and getting worse. Urine still contains large amount of albumin.

Physical Examination.—Same as before. A sinus at the site of the old wound four inches and a half deep. Profuse discharge.

Operation, April 3, 1890.—Ether. A five-inch incision in the line of the former one was carried down until the kidney was reached. The tissues were greatly infiltrated and all landmarks entirely obliterated. The kidney was greatly enlarged. The pelvis was dilated and containing numerous pouches of thick, creamy pus. Adhesions were so firm that great difficulty was found in enucleating the organ sufficiently to form a pedicle. In spite of the greatest care in manipulation, a rent was made in the inferior vena cava. This was closed by a long clamp left *in situ*.

The kidney was finally removed and the wound packed with iodoform gauze.

The condition of the patient was very poor at the close of the operation, but she rallied under stimulation and recovered consciousness. The pulse rose to from 140 to 160 on the following day and the temperature to 102°. The lower extremities were warm, but became purple eighteen hours after the operation. She gradually failed, and died forty hours after the operation. Exploration showed a rent in the vena cava.

Pathologist's Report.—The kidney was greatly increased in size and contained numerous cavities, varying in size from that of a hickory-nut to that of a pigeon's egg. Microscopical examination showed extensive inflammatory involvement of the kidney with typical tuberculosis. The tubercles varied in size and contained many giant cells.

Case III. *Chronic Peritonitis following Typhoid Fever simulating Appendicitis; Laparotomy; Recovery.*—W. E., aged twenty-three, single, German, was admitted to the hospital on September 5, 1889, and was treated on the medical side for typhoid fever. He was discharged cured on October 28th. After leaving the hospital, he had recurrent attacks of abdominal pain, mostly in the right iliac region, and extending into the lumbar region.

He was readmitted on January 1st, 1890, and transferred to the surgical side on March 15th. During this time he had had two or three attacks of pain in the right iliac region, accompanied by an indistinct tumefaction and tenderness on pressure. Rectal examination was negative. His general condition was fair; there was moderate constipation, with some nausea and occasional vomiting.

Operation (Exploratory Laparotomy), March 15, 1890.—Ether. A longitudinal incision was made at the right of the linea alba three inches and a half long. The cæcum seemed to be abnormally fixed in the pelvis, and the appendix could not be found. Extensive manipulation was not thought desirable, and the wound was closed. No drainage was used. The wound healed quickly, and the patient made a good recovery. In the third week after the operation he had persistent nausea and vomiting, but no abdominal pain; a slight feeling of discomfort only. He was up and about in the third week, his condition improved somewhat, and he was discharged.

Case IV. *Pistol-shot Wound of the Abdomen; Laparotomy (for Hæmorrhage); Death.*—W. T., aged fifty-four, married, a large, muscular man, was brought into the hospital, at 8 P. M., on March 22, 1890, having been shot in the abdomen (with a ·38 caliber pistol) ten minutes previously. When seen by the ambulance surgeon, he was conscious, but when he arrived at the hospital the radial pulse was hardly perceptible, and he was unconscious and suffering from profound shock, evidently due to internal hæmorrhage.

Physical Examination.—Dullness in the flanks. No tympanites. There was a bullet wound four inches below and two inches to the left of the umbilicus. Free stimulation was employed subcutaneously. The extremities were bandaged, and the patient was taken at once to the operating-room. Operator, Dr. Coley. Venous infusion ($\overline{3}$ xvj of warm water) quickly into the arm, and a four-inch median incision was made below the umbilicus. The abdominal cavity was filled with blood and clots. The breathing, which had been getting more and more shallow, stopped entirely almost as soon as the abdomen had been opened. Further exploration was not made,

and, as there was no autopsy, the extent of visceral injuries is not known.

Case V. *Tubercular Peritonitis* (?).—W. F., aged forty-five, male. General health always good. No tubercular family history. For the past three years a slow increase in the size of the abdomen. Slight loss of flesh and strength. Bowels constipated. Urine normal. Slight pain in the abdomen, but not constant.

Physical Examination.—Abdomen moderately enlarged. A large amount of adipose tissue in the abdominal wall, and palpation unsatisfactory. The umbilical and hypogastric regions were occupied by a diffuse tumor, irregular and nodular, and but slightly movable. Rectal examination showed a mass in the pelvis, but not connected with the tumor in the abdomen.

Operation, May 13, 1890.—Exploratory incision down to the peritonæum—four-inch incision. Several small, hard, nodular masses were felt attached to the parietal peritonæum, and similar nodules apparently connected with the omentum and mesocæcum.

It was thought best not to open the peritonæum, and the wound was closed. Further operation was not advised. Primary union. Discharged.

Case VI. *Tubercular Salpingitis, with Tubercular Peritonitis; Laparotomy; Death.*—S. C., aged twenty-five, single (colored). General health good until two months ago. Pain in the hypogastric and right iliac regions for the past two months. Rapid loss of flesh and strength.

Physical Examination.—Chest, signs of consolidation at both apices; systolic murmur. Abdomen slightly tender, more so on the right side. Uterus enlarged and movable. A soft, tender tumor felt in the right broad ligament.

Operation, May 31, 1890.—Four-inch median incision between the umbilicus and pubes. Omentum slightly adherent. Parietal and visceral peritonæum studded with small miliary tubercles. Both tubes and ovaries considerably enlarged, adherent to the adjoining parts by firm adhesions, and forming an almost unrecognizable mass.

In separating the adhesions, a small rent was made in the small intestine. This was closed with fine silk. Considerable hæmorrhage followed the separation of the adhesions. The cavity was washed out with boiled water, and a glass tube and iodoform tampon were left in the wound. Her condition remained fairly good until the third day; she then began to have a thin discharge from the wound, containing urine. Signs of peritonitis quickly developed, and death followed on the fifth day after the operation.

The autopsy showed both the right and left pleuræ everywhere adherent (adhesions old); both lungs contained cheesy masses and small cavities. Tubercles were found in the spleen and peritonæum. The greater omentum was bound down in the pelvis by recent adhesions. A small rent was found in the bladder wall, and a small amount of sero-purulent fluid in the pelvic cavity.

Pathologist's Report.—The ovaries could not be recognized in the mass removed. The Falloppian tubes were filled with giant cells, and there were areas of necrobiosis, but no trace of mucous membrane of tubes was present.

Case VII. *Acute Oophoritis; Local Peritonitis, threatening to become General; Laparotomy; Recovery.*—M. B., twenty-six years of age, married. The patient had had one child six years before; labor was prolonged and instrumental. She had had pain in the back, menorrhagia, and general weakness ever since. Four weeks previous to the operation these symptoms became exaggerated, and pain and marked tenderness became localized in the right ovarian region. Examination showed a soft, tender mass of the size of a goose-egg in the right broad ligament. She had well-marked local peritonitis with several severe exacerbations, the temperature reaching 103° and the pulse 120, accompanied by some distention and general abdominal pain. At one time general peritonitis was thought inevitable, and an operation was advised, but the patient would not consent. Constant application of the ice-coil caused the dangerous symptoms to subside, but another exacerbation followed a week later, and she consented to an operation.

Laparotomy, May 31, 1890.—The left tube and ovary were

found normal and were not disturbed. The right tube showed well-marked evidence of catarrhal inflammation, but contained no pus; both tube and ovary were enlarged and they were removed. The adhesions were few and recent. No irrigation and no drainage employed. Recovery was rapid and uninterrupted, and she was up and about at the end of three weeks and a half.

The pathologist's report showed the ovary slightly enlarged and containing numerous small cysts. Microscopical examination showed the ovary infiltrated with round cells. Numerous corpora lutea were seen in various stages of degeneration.

Case VIII. *Intestinal Obstruction of Six Days' Duration; Bands; Suppurative Peritonitis; Death.*—D. H., aged eighteen, male. Previous health good. He had a congenital hernia, which six days ago became considerably larger after jumping. He reduced it quickly, but almost immediately was seized with severe abdominal pain, which was soon followed by nausea and vomiting. These symptoms continued and there was absolute constipation. Gradually grew weaker. Admitted to hospital on November 24th, the sixth day of the disease.

Physical Examination.—Abdomen tense and very tender. Considerable tympanites. Inguinal canal free and no tumor felt in the abdomen. Pulse, 120°; temperature, 102°. Vomited frequently, and the vomitus was fæcal in character. General condition very poor.

Operation, November 24, 1889 (shortly after admission).—Chloroform. Median incision four inches and a half. Immediately above the inguinal canal was found a band either end of which was attached to parietal peritonæum, constricting a loop of small intestine so greatly as to obliterate its lumen. The band was removed, but evidence of well-marked peritonitis was already present. Warm-water irrigation. Patient rallied somewhat from the operation under free stimulation, but signs of peritonitis continued to increase, and on the third day he died.

The autopsy showed recent adhesions and a moderate amount of lymph in abdominal cavity. The intestines were greatly distended and matted together. There was a lacerated wound a quarter of an inch in diameter in the ileum.

Case IX. *Intestinal Obstruction of Five Days' Duration; Diverticulum; Suppurative Peritonitis; Laparotomy; Death.*—C. D., thirty years old, male. Previous health good. Admitted November 16, 1889, with the following history: Five days ago he had sudden severe pain in the abdomen coming on soon after a hearty meal of cabbage. A little later nausea and vomiting; symptoms increased in severity and vomiting became fæcal in character. Absolute constipation.

Physical Examination.—Abdomen tympanitic. Resonance less marked on the right side. General condition very poor; marked prostration. Pulse 140 and very feeble; temperature 102·5°. Tongue moist, face pale, and intellect clear. Operation soon after admission. Chloroform. Median incision below the umbilicus. Considerable quantity of sero-purulent fluid in the abdominal cavity. Intestines congested and distended. Near the brim of the pelvis on the right side was found a *diverticulum* of the ileum, about three inches long, closely resembling an appendix. Its distal end was adherent to the parietal peritonæum, and, thus acting as a band, it had constricted a loop of small intestine, producing complete obstruction. In manipulation, the base of the diverticulum was torn off, disclosing an abscess containing about a pint of foul pus. Abdominal cavity washed out with warm water. Glass drain. Time of operation, one hour. The patient did not recover from the shock of the operation, and died two hours later.

Case X. *Acute Intestinal Obstruction following Fracture of the Twelfth Dorsal Vertebra; Paralysis of Intestine; Laparotomy; Death.*—D. F., aged fifty, male, Ireland. Previous health good. Brought to hospital March 4, 1890, in the ambulance. Had just fallen one story, striking on the right thigh and back. Patient was conscious and complained of severe pain in the thigh and in the lumbar region.

Physical examination showed an oblique fracture of the right thigh at the junction of the middle and upper thirds, with one inch shortening. Slight tenderness in the lumbar region of the spine, but no deformity and no paralysis. Patient was given ether, and the fracture of the thigh was reduced and put up in a Buck's extension apparatus. He

vomited for some time after the ether. Vomiting continued at intervals during the greater part of the next day, and was accompanied by pain and discomfort in the abdomen.

Third day.—Vomiting continues; unable to retain anything in the stomach; abdomen slightly distended; no tenderness; bowels constipated.

Fourth day.—Condition about the same; vomiting more frequent and the vomited matter dark-brown, but not fæcal; an ox-gall enema was very slightly effectual.

Fifth day.—Seems considerably better; able to retain milk and lime-water; bowels moved once after a large enema of ox-gall.

Sixth day.—Evidently growing weaker; the abdomen, slightly distended before, is now markedly tympanitic; vomited at 11 A. M. a large quantity of dark fluid, distinctly fæcal.

Operation, 1 P. M.—Chloroform; a seven-inch median incision; the whole intestine, except the rectum and sigmoid flexure, greatly distended, making an examination impossible until three punctures had been made in the small intestine with a medium-sized trocar, letting off a large quantity of gas; the punctures were closed with Lembert sutures of silk. Careful examination failed to reveal the cause of the obstruction. The small and large intestine seemed equally distended. The patient's condition was very poor, and the wound was closed. Time of operation, an hour and a half. The patient reacted from the anæsthetic, but gradually grew weaker, and died at 10.35 P. M.

The autopsy disclosed a fracture of the spine, or rather a loosening of the joint between the last dorsal and first lumbar vertebræ, with a slight chipping off of both bones anteriorly, but giving rise to no displacement.

CASE XI. *Old Suppurative Salpingitis, with Acute Septic Peritonitis; Laparotomy; Recovery.*—C. B., twenty-one, Ireland, domestic. General health poor. Signs of incipient phthisis in both lungs. Menstrual history irregular for the past year. For the last three months occasional sharp, shooting pains in the lower portion of the abdomen, accompanied by a white discharge from the cervix. Pain and discharge have continued.

Admitted February 7, 1890 (medical side). Transferred from the medical side March 6, 1890.

Physical examination at time of entrance: Temperature, 99·6°; pulse, 90; respiration, 26. Vagina: a tender swelling, of the size of a small orange, in the right fornix, non-fluctuating.

Treatment.—An ice-coil to the abdomen. The symptoms quickly became less marked, and the patient was soon able to sit up.

February 23d.—Pain and tenderness recurred. Treatment the same as before, with relief of the symptoms.

March 6th.—Up and about the ward, feeling as well as usual, until 4 P. M., when she was taken with sudden and severe abdominal pain, at first localized but soon becoming general. The temperature rose to 103 8°, and the pulse to 120. At 6 P. M., nausea, but no vomiting. Ice-coil applied to the abdomen. Thirteen minims of Magendie's solution of morphine given subcutaneously.

9 P. M.—Condition about the same. Abdomen markedly tender and slightly tympanitic. Transferred to the surgical side.

Operation, 10.30 P. M.—Dr. Bull. Chloroform. A four-inch median incision below the umbilicus; a pint and a half of turbid sero-purulent fluid in the cavity. On the right side, deep down in the pelvis, was a mass of the size of two fists, to which the intestines were bound by old and firm adhesions, which were separated with great difficulty. Scattered over two feet and a half of small intestine were six patches of old, well-organized, fibrinous exudation, varying in diameter from three quarters to an inch and a half, with edges blackened and elevated, the peritoneal coat having been stripped off, leaving only the red muscular layer behind. These patches were rubbed with iodoform powder. The mass itself, in the pelvis, was found to consist of an enlarged suppurating Falloppian tube and right ovary. These were removed and the abdominal cavity was washed out with warm water. Glass and iodoform-gauze drains. Recovery uninterrupted, save by an attack of bronchitis on the ninth day. The tube was left in six days, and then a smaller rubber tube introduced and the sinus washed out with weak bichloride solu-

tion. The discharge continued profuse for three weeks, and then gradually decreased. Discharged cured June 1, 1890.

Pathologist's Report.—Microscopical examination showed extensive infiltration of small round cells in both the ovary and the Fallopian tube. The walls of the tube were very much thickened.

Case XII. *Acute General Peritonitis following a Perforating Ulcer of the Cæcum; Laparotomy; Recovery.*—L. H., aged twenty one, female, single, German, always well until three days previous to admission, when she was taken with severe sudden pain in the abdomen following a hearty meal of potato salad. The pain increased in severity and soon became localized in the right iliac region. Nausea and vomiting quickly followed, and have since continued with increasing frequency. Admitted on the third day of the disease.

Physical Examination.—Abdomen: a sense of resistance in the right iliac region with indistinct tumefaction; marked tenderness and dullness on percussion in the same region; temperature, 100·2°; pulse, 102.

Fourth Day, A. M.—Abdominal tenderness now general. Pulse rapid and small, temperature 103°, vomiting frequent and the vomited matter greenish; moderate tympanites. Transferred to the surgical side on the afternoon of the fourth day and laparotomy at once performed. Anæsthetic, ether; a five-inch longitudinal incision just beyond the outer border of the right rectus muscle. The deeper muscular layers were of a grayish color and infiltrated. The parietal peritonæum and omentum were adherent. The adhesions were carefully separated, exposing the cæcum, which, for a distance of two inches and a half above the appendix, was found to be dark colored and gangrenous over an area an inch in diameter and in places perforated. The appendix itself was thickened and inflamed, but contained no perforation. An abscess containing several ounces of foul-smelling pus was found just behind the appendix, and two small fæcal concretions were found free in the abdominal cavity.

The diseased portion of the cæcum, an inch and a quarter by three quarters of an inch, was removed with scissors, and

the wound closed with Lembert sutures of fine silk. The appendix was tied off at the base and removed. The intestines were covered with fibrinous exudation, and the abdominal cavity contained a moderate quantity of sero-purulent fluid. A large mass of adherent and inflamed omentum was tied off and removed. The abdomen was thoroughly irrigated with warm water. Iodoform-gauze and glass drains reaching to the bottom of the pelvis were used, and an ice-coil was applied as soon as the patient reached the ward. No pain and no tenderness followed the operation. Temperature below 100° most of the time. The patient made a rapid recovery.

Case XIII. *Acute Septic Peritonitis dependent on Suppurating Adenoma of the Ovary; Abdominal Section; Death.*— The patient was a woman, twenty-six years old, married, and had had one child a year before. Her general health had been good until four months previous to entering the hospital. Since that time she had had two attacks of severe localized pain in the right iliac region. Six days before she was brought to the hospital a similar but severer attack occurred. It was ushered in by nausea and vomiting, abdominal pain, and tenderness, which, though localized at first, rapidly became general. Constipation was absolute from the beginning of the attack. She was brought to the hospital in the ambulance on March 16, 1890. She was then in a condition almost bordering on collapse. Temperature, 101·4°; pulse, 140; respiration, 44. The radial pulse was scarcely perceptible. Tympanites was marked; there was general abdominal tenderness. Abdominal section was made two hours later as a last resort, and with only very slight hope of success. The intestines were found greatly distended and markedly congested. A moderate quantity of turbid serum was found in the abdominal cavity.

Deep down in the pelvis on the right side, and firmly attached to the adjoining parts by old adhesions, was a mass of the size of a cocoanut consisting of broken-down cheesy matter. This evidently had its origin in the right ovary, but no trace of the right ovary could be found. The appendix vermiformis was seen and was apparently healthy. The mass was removed, and the abdomen irrigated and drained. The patient never recov-

ered from the shock, and died eighteen hours later. Microscopic examination showed the tumor to be an adenoma of the ovary which had undergone extensive degeneration.

Operations on the Liver.—Case XIV. *Calculus of Cystic Duct; Cholecystotomy; Death.*—L. B., aged thirty-seven, male. He was well developed and well nourished, and his general health had been good until the past two or three years, during which time he had had several severe attacks of hepatic colic. He was operated upon on May 27, 1889, at the New York Hospital. The gall-bladder was opened, and its walls were found considerably thickened, but no gall-stone could be found. He made a good recovery, but a small sinus remained, discharging a thin, yellow, muco-purulent fluid. He had no recurrence of symptoms until four days previous to his admission, when he had a very severe attack of biliary colic. Admitted on October 22, 1890.

Operation, October 26, 1890.—Ether. An incision three inches and a half in length was made in the line of the old cicatrix. The adhesions between the parietal peritonæum and the underlying viscera were very firm. The cystic duct was found enlarged and its walls were three eighths of an inch thick. On cutting through it there was found a calculus about three quarters of an inch in diameter. This was removed and an iodoform drain placed in the wound, with a small glass drain in addition. He vomited soon after the operation, but did fairly well for three days, and then symptoms of peritonitis developed and he died on the seventh day.

Autopsy.—No peritonitis. The omentum was adherent to the peritonæum above the incision. The common, cystic, and hepatic ducts were normal and pervious. Death was probably the result of intestinal obstruction caused by adhesions following the operation.

Case XV. *Biliary Calculi; Cholecystotomy.*—J. W., aged forty-eight, male. About four months ago he began to have severe attacks of pain in the hepatic region, paroxysmal, and occurring at frequent intervals. There was slight jaundice at times and there was an indefinite tumefaction in the region

of the gall-bladder, with slight tenderness. His general health has been considerably impaired.

Admitted June 23, 1890. General condition poor. No distinct tumor, but a sense of fullness in the right hypochondriac region. No icterus present.

Operation, June 25, 1890.—Ether. An incision four inches in length was made in the right mamillary line, beginning just below the free border of the ribs. The gall-bladder was slightly enlarged and elongated. No calculus could be felt before opening it, but, on cutting through the slightly thickened wall, fifteen small calculi were pressed out. The duct appeared to be empty. The wall of the gall-bladder was then brought up and stitched to the abdominal wound, thus making a biliary fistula, and a small rubber tube was left in the wound.

Subsequent Progress.—The temperature rose to 102·4°, and the pulse was rapid and feeble soon after the operation. Severe sharp pain, similar in character to the old pain, began the next day, accompanied by vomiting of dark biliary matter. The patient rapidly grew worse, and died forty-eight hours after the operation.

Case XVI. *Large Abscess of the Left Lobe of the Liver; Operation; Death.*—F. F., male, forty-eight years of age, born in England. Patient had been living in the United States (the South) the past ten years. He was admitted to the hospital October 31, 1889. About two months previous to admission he began to have occasional attacks of syncope and vomiting, occurring three or four times a week. These continued for a month, when slight jaundice appeared, accompanied by deep-seated epigastric pain, which was aggravated by exertion or deep inspiration. Headache and slight fever at night, accompanied by profuse sweating, quickly followed, and about the same time he noticed a small, tender swelling in the epigastrium. The swelling slowly increased in size, and his general health became markedly impaired; he lost twenty-five pounds in two months.

The bowels were constipated, and occasionally a small amount of blood was noticed in the stools.

The patient was kept under careful observation for two

weeks, but no positive diagnosis could be reached. The most probable diagnosis was thought to be either acute pancreatitis or abscess of the liver.

Physical examination showed a tumor occupying the epigastric and a portion of the left hypochondriac regions, bounded on the left by the mamillary line and extending from the sixth costal cartilage above to a point three inches above the umbilicus below. The tumor was apparently deep-seated and not attached to the parietal peritonæum.

The tumor was markedly tender and pulsated distinctly. The heart was displaced upward, so that the apex beat was felt in the fourth intercostal space. Dilatation of the stomach caused no change in the area of the tumor dullness, and stomach resonances extended beyond the axillary line. The stools were of a yellowish color, and on one occasion contained blood. The temperature ranged slightly above normal (99° to 101°).

Exploratory laparotomy was performed on November 13, 1890. Anæsthetic, ether. An incision three inches and a half long was made parallel to and two inches and a half to the left of the median line, beginning at the free border of the ribs. On going through the peritonæum, the left lobe of the liver was seen, greatly enlarged, with the capsule tense and glistening. The finger was passed beneath, but no other tumor could be felt. The upper portion of the wound was then closed and the lower part left open and packed with iodoform gauze, in order to promote adhesions between the liver and the parietal peritonæum.

November 14th.—Patient was very restless, notwithstanding half a grain of morphine had been given during the night. He vomited several times during the first twenty-four hours, and the vomitus consisted of a dark reddish-brown fluid, which microscopic examination showed to contain considerable blood.

15th, A. M.—Temperature, 101·2°; respiration, 24; pulse, 140 and very weak. At 10 A. M. the abscess was opened with a bistoury, inward, and about a quart of yellowish pus mixed with blood escaped. The patient continued to grow weaker, and at 5.45 P. M. died.

Perityphlitis.—Case XVII. *Perityphlitis, Suppurative; Laparotomy; Death.*—P. M., aged twenty-five, single, male. Previous general health always good, with the exception that during the past few years he had had a number of attacks of severe pain in the right iliac region.

The present illness began ten days previous to his admission, with pain in the right iliac region, accompanied by constipation and slight fever. The pain increased, and subsequently a slight swelling appeared in the same region.

Admitted November 28, 1889. Temperature, 99°; respiration, 28; pulse, 120. The abdomen was slightly tympanitic, and low down on the right side was an area of induration and indistinct tumefaction, markedly tender on pressure and slightly dull.

Operation, November 28, 1889.—Ether. An incision three inches long was made along the outer border of the right rectus muscle and parallel with the median line. The deeper muscular layers were grayish and infiltrated. The omentum, cæcum, and lower portion of the ileum were bound down in the iliac fossa by firm adhesions. In the region of the cæcum an abscess containing about one or two ounces of pus was found, but its exact relation to adjoining tissues could not be made out. The appendix could not be found. After thorough irrigation with warm water, an iodoform tampon was placed in the wound extending to the abscess cavity, and the external wound was then partially closed. The pulse was very rapid and weak at the close of the operation. The temperature rose gradually, and the following day, about twenty-four hours after the operation, he died.

No autopsy.

Case XVIII. *Perityphlitis; Operation; Recovery.*—H. B., aged twenty-three, German, male, always well. Present illness began fourteen days previous to admission, with pain in the abdomen following a hearty meal. The pain was chiefly confined to the right lower abdomen. It continued dull and constant, but occasionally severe, and at the end of a week he noticed a swelling in the same locality. A few days later nausea and vomiting began. All the symptoms have steadily increased in severity. There is constipation, but not absolute.

Admitted October 1, 1890. Temperature, 102·8°; respiration, 32; pulse, 116. A small, tender tumor was seen in the right iliac fossa; no general abdominal tenderness.

Operation.—Soon after admission, October 1, 1889, an incision three inches long was made, extending upward from the middle of Poupart's ligament. An abscess cavity containing two or three ounces of foul-smelling pus was opened, and beyond, forming the posterior wall of the abscess, were seen the cæcum and omentum matted together. A sponge on a long clamp was passed into the pelvic cavity, but no pus was found. Thorough warm-water irrigation. A large rubber drain left in the wound.

Subsequent Progress.—The discharge was very profuse for the first week and then began to show traces of fæcal matter. This continued until October 19th, and then the discharge slowly diminished. He left the hospital on November 29th with a small sinus, which did not heal completely until six months later.

Case XIX.—M. K., aged twelve, female. Operation for fæcal fistula following an operation for perityphlitis performed two months before. No effect.

Case XX.—M. B., aged twenty-eight, female. Persistent sinus following laparotomy, done November 22, 1889. Sinus enlarged and curetted July 1, 1890. No effect.

Case XXI.—*Pelvic Abscess following Childbirth* three months previous to admission Incision; drainage; delayed recovery.

Case XXII.—*Large Pelvic Abscess following Confinement* two months before.

Operation, November 16, 1889.—Three-inch incision and about two quarts of pus evacuated. Discharged with open sinus, but improved greatly within three months.

Case XXIII. *Pelvic Abscess; Recurrent Localized Peritonitis; Laparotomy; Recovery.*—M. B., aged thirty-seven, married; has had two children, the last eight years ago. Admitted October 29, 1889. She was then suffering from the fourth attack of pelvic peritonitis, the first having occurred about a year before. The temperature was 102·6°, and examination revealed

a small tumor in the left iliac region, very tender on pressure and fixed in the pelvis.

Treatment.—Rest in bed and poultices to the abdomen.

Operation, November 7, 1889.—Laparotomy; ether. An incision three inches and a half in length was made in the median line of the abdomen below the umbilicus. A large abscess was found in the pelvis on the left side attached to the rectum, sigmoid flexure, and uterus by firm adhesions. The abscess wall was ruptured. The pus was sponged out, and free irrigation and both abdominal and vaginal drainage were employed. The patient made a good recovery.

ABDOMEN.

(*b*) *Herniæ.*—There were 35 operations for herniæ, divided as follows: Inguinal, 31 cases—cæcal, 2; properitoneal, 2; reducible, 21; irreducible, 5; and strangulated, 5. Femoral, 4 cases—reducible, 3; irreducible, 1. Umbilical, 1 case—strangulated.

Operations for hernia, 35 cases—recoveries, 33; deaths, 2 (strangulated).

The method of operation pursued in the ordinary cases may be briefly stated as follows: A two-and a-half-inch to three-and-a-half-inch incision was made in the line of the inguinal canal. The sac, having been exposed just below the external ring, was cut across transversely, and the contents of the intestine were returned to the abdominal cavity. Omentum, in small quantities and in good condition, was returned, but in most cases it was ligated with strong silk and removed. The upper portion of the cut sac was then freed from adjoining tissues and ligated with catgut as high up as possible. The pillars of the ring were next approximated with interrupted catgut sutures, usually three or four in number, embracing the conjoined tendon, as well as the external and internal pillars of the ring. The lower portion of the sac, unless easily

dissected out, was allowed to remain, and was drained through the scrotum.

The external wound was then closed, generally with a small rubber drain at the lower extremity, but frequently with out drainage.

An antiseptic dressing, with moderate pressure obtained by means of rubber plaster and a spica or hernia bandage, was applied and allowed to remain from five to seven days.

The patients were allowed to sit up, as a rule, at the end of ten days, and at the end of two weeks, if no sinus remained, they were allowed to go out, wearing a Heaton bandage, with a light pad over the wound. A light truss was advised as soon as the cicatrix had become firm.

Ball's method was employed in four cases. The sac, instead of being removed high up, was twisted and then sutured in the canal by means of interrupted catgut sutures.

The cases possessing points of unusual interest are given with more or less detail below, while the ordinary cases have been arranged in tabular form, containing only the more important points.

These may be still further summarized as follows:

Average Time in Hospital.—For twenty-four uncomplicated cases the average duration of hospital treatment was 23·6 days. Nine patients left the hospital within two weeks.

Omentum.—In eleven cases larger or smaller masses of omentum were ligated and removed. Four of these cases were followed by subsequent inflammation of the omental stump. In one instance this was so severe as to give rise to a sharp attack of localized peritonitis in the epigastrium. This occurred about the end of the third week following the operation, and the patient had been up and about the ward. There was an area of well-marked induration in the epigas-

trium, circular in shape and three inches in diameter. This was exquisitely tender on pressure, and was accompanied by considerable constitutional reaction (temperature, 101·6° F.; pulse, 120). This lasted about a week, and symptoms gradually subsided under constant use of an ice-bag.

In one other case (irreducible femoral hernia) the patient left the hospital in February, 1890. A small mass of omentum had been tied off at the time of the operation. The wound healed quickly and he left the hospital at the end of twelve days. He returned in May, three months later, complaining of dull pain in the right iliac region. By careful deep palpation an indistinct tumor could be felt, apparently in the region of the cæcum. The symptoms were not well marked, and at the end of a week, there being no increase in severity, he was discharged. In August, 1890, six months after the operation, he again returned to the hospital. The tumor was larger and more clearly defined; tender on pressure and deeply seated in the region already described. He complained of pain, loss of appetite, and constipation, and his general condition was evidently impaired.

A second operation was performed, an incision being made over the tumor in the iliac region. The mass was found to be the remains of the omental stump, firmly adherent to the anterior abdominal wall and to adjacent viscera by old plastic exudations that had become organized. The mass was removed and the patient made a good recovery.

Drainage was employed in eighteen of the twenty-four cases. The average time each patient was in the hospital in the cases where drainage was employed was twenty-seven days; where no drainage was used it was only thirteen days and two thirds.

Mortality.—The only fatal cases were two in which the

operation was performed for prolonged strangulation. In one case, described at length below, the prognosis was very grave owing to the complication of advanced nephritis and diabetes. In addition, the hernia was umbilical and the portion of intestine strangulated very large.

The very large mass of firmly adherent omentum likewise added to the length and severity of the operation.

The remaining fatal case was that of an infant who was almost in collapse at the time of operation.

The following cases possessing points of special interest are given somewhat in detail:

CASES OF UNUSUAL INTEREST.

Case I. *Properitoneal Epiplocele with Large Serous Effusion in an "Hour glass" Sac, resembling a Cystic Tumor of the Abdominal Wall.*—The patient was a woman, forty-two years of age, in good general health until five years previous to admission. At that time, without apparent cause, a swelling appeared in the lower portion of the abdomen on the right side.

The tumor at first was reduced in size by decubitus, but afterward was not affected by position. During the five years she had seven attacks of severe abdominal pain, localized in the region of the tumor and accompanied by nausea and vomiting. During these attacks the tumor always showed a marked increase in size. At the time of operation, January, 1890, the lower portion of the abdomen on the right side was occupied by an oblong tumor, twelve by four inches, extending from two inches above the anterior superior spine of the ilium to the middle of the labium. The skin was normal and the lower half of the tumor was distinctly fluctuating. There was no impulse on coughing and the tumor was dull over the whole area. (See Fig. 1.)

Operation.—A five-inch incision disclosed a sac containing several ounces of clear fluid and extending down into the right labium. Above this sac and connected with it by means of a small lumen was another and larger sac, containing a mass of

thickened omentum of the size of the fist and firmly adherent to the neck of the sac.

The omentum was carefully ligated and removed. The stump was returned to the abdominal cavity and the wound closed, free drainage being secured by rubber tubes.

Fig. 1.

Some suppuration followed, but the patient made a good recovery. The position of the hernial sac was apparently between the transversalis fascia and the overlying muscles.

Case II.—*Properitoneal Hernia, with Undescended Atrophied Testis; Radical Operation; Castration.*—The patient was thirty-six years of age, and since childhood had noticed a swelling in the right inguinal region. The scrotum had never contained more than one testis. During the last year and a half he had worn a truss, but this had caused considerable pain—so much that he decided to submit to an operation. Examination showed an elliptoid swelling in the right iliac region, extending from

just below the level of the anterior superior spine obliquely down to the internal abdominal ring. The tumor was dull on

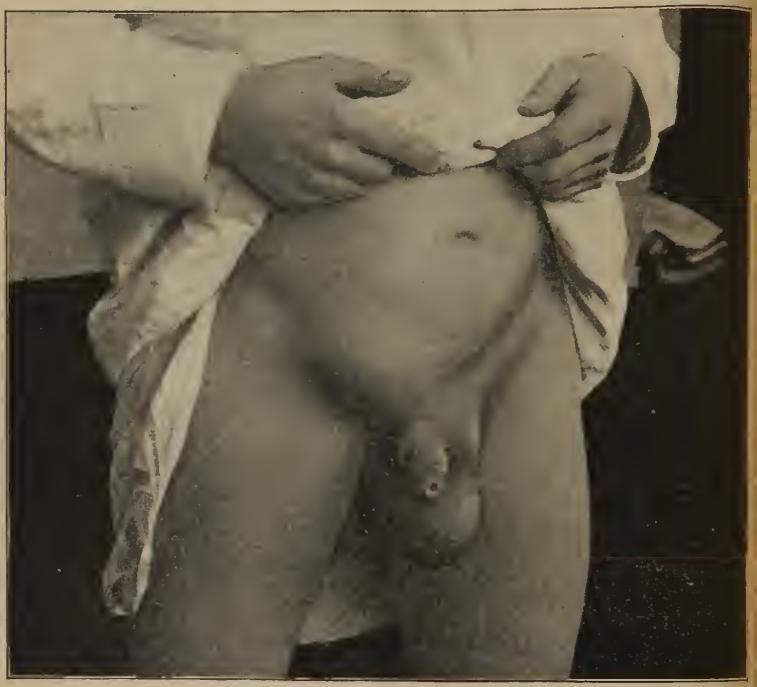

Fig. 2.

percussion and gave a distinct impulse on coughing, but the size was affected neither by change in position nor by manipulation. (See Fig. 2.)

Operation, January, 1890.—A three-and-a-half-inch incision over the lower portion of the tumor revealed a sac, situated just beneath the muscular plane, containing an atrophied testis. Posterior to this sac and entirely separate from it was found a

second larger sac, which contained a mass of adherent omentum. This sac was a true hernial sac, but, instead of following the usual course and emerging at the external ring, it had apparently dissected up between the transversalis fascia and the overlying muscles, and had formed an interparietal pouch. The omentum was firmly adherent at the internal ring.

The adhesions were freed, the mass of omentum tied off, and the stump returned into the abdominal cavity. Recovery was rapid and uninterrupted.

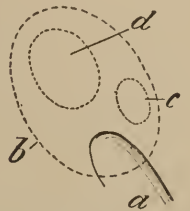

FIG. 3.—*a*, the external abdominal ring; *b*, the sac (the tunica vaginalis) just beneath the external oblique aponeurosis; *c*, the atrophied testis; *d*, the deeper properitoneal sac bulging into the tunica vaginalis and containing omentum.

These cases have been given somewhat minutely because they are so exceedingly rare.

Dr. Torrey, of Brooklyn, reported a very interesting case in 1888,* and following the report of the case is an excellent summary of the literature of the subject. According to his statistics the total number of cases reported from 1749 to 1888 is 35, with 28 deaths. In a very large number of these cases the diagnosis was not made until the autopsy, and in some cases distinguished surgeons had failed to recognize the true nature of the hernia at the time of operation.

In Langenbeck's case (1875) a tumor in the right groin had been reduced, but symptoms of strangulation continuing, an operation was performed, on the supposition that the reduction had been *en masse*. A portion of the intestine was found gangrenous. This was resected and the remainder of the loop returned into a cavity which the surgeon supposed was the abdominal. The patient died, and the autopsy showed the intestines had been simply re-

* *Annals of Surgery*, 1888, p. 160.

turned to a properitoneal pouch, situated between the parietal peritonæum and the fascia transversalis.

In addition to Dr. Torrey's case, another was reported by Dr. Hartley, of New York, in 1887,* which resulted in recovery. Both cases presented symptoms of intestinal obstruction following the reduction of a previously existing hernia. The reduction in Dr. Torrey's case was nine days, and in Dr. Hartley's case five days, prior to the operation. In the former case stercoraceous vomiting had existed for five days, and the patient was almost in collapse at the time of the operation. In one case the pouch was situated between the transversalis fascia and the overlying muscles, while in the other it was found between the parietal peritonæum and the fascia transversalis.

Although this form of hernia is so seldom met with, still the failure to recognize it early is fraught with such serious consequences to the patient that it becomes a duty to render the diagnosis as clear as possible. The cases that have been reported thus far have been almost entirely intestinal. It is quite possible that omental herniæ of this variety may occur as frequently, but, being less liable to become strangulated, they would be less likely to be recognized.

In a large number of the cases the hernia was of the congenital type, and associated with an undescended testis. In fact, some writers—*e. g.*, Streubel—are inclined to give a distinctly causal relation to this fact, believing that the testis in the canal offers sufficient obstruction to change the direction of the hernial progress. The same would be true of an imperfect truss.

The undescended testis and the imperfect truss are undoubtedly important, if not the only factors, in the production of this variety of hernia. In regard to the diagnosis I

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am able to add but little. The accompanying photographs show the external appearance in the cases described. I have seen one other case at the Hospital for the Ruptured and Crippled, in which the probable diagnosis of a reducible properitoneal hernia was made. After apparent reduction a distinct tumor could be felt in the right iliac region. On further manipulation, this disappeared within the abdominal cavity, reduction having been obtained by pressure downward and inward.

Points in Diagnosis.—The previous history of hernia, reducible at first; the presence of an undescended testis in the canal, or anything else that might offer a mechanical obstruction to the further descent of the hernial sac—*e. g.*, a hydrocele of the cord (or of the canal of Nuck in the female), or an ineffective truss—one or more of these conditions associated with a tumor in the iliac region would enable one to make a *probable* diagnosis of properitoneal hernia.

The first case of Dr. Bull's is the only one I have found reported occurring in a woman. In this case the hydrocele of the canal of Nuck, gradually increasing in size, undoubtedly furnished the obstruction which caused the hernia to dissect upward, forming a pouch in the intermuscular layers.

Case III. *Strangulated Direct Inguinal Hernia, with very Acute Symptoms; Operation; Recovery.*—The patient, a male, nineteen years of age, had had no previous history of hernia. While making a strong effort to pass urine (having been obliged to retain it for a long time) he felt something give way in the right inguinal region, and at the same time a swelling of about the size of an egg appeared. He was seized with sudden and excruciating pain, quickly followed by nausea and vomiting. He was brought to the hospital an hour later almost in a state of collapse.

There was a tumor in the right inguinal region of the size

of a hen's egg, but not extending into the external ring. The skin was reddened, and tenderness was very marked. (Operator, Dr. Coley.)

A three-inch incision disclosed a hernial sac containing considerable yellow serum, and a knuckle of small intestine four inches in length, moderately congested. The constriction at the neck of the sac was exceedingly tight, and had to be very freely divided with a blunt-pointed bistoury before the intestine could be returned. The wound was closed in the usual way and prompt recovery followed.

Case IV. *Very Large Strangulated Umbilical Hernia, complicated with Diabetes and Chronic Parenchymatous Nephritis; Operation; Death.*—D. M., aged sixty-three, female, born in Ireland. Her general condition had long been very poor. Her urine before the operation contained four and a half per cent. of sugar and a large amount of albumin, with hyaline, granular, and waxy casts.

She had been suffering from an umbilical hernia for eighteen years, reducible in part until thirty-six hours previous to operation. There was present in the region of the umbilicus a tumor of the size of a man's head, irregular in shape and very tense. The skin was reddened and the tumor was partly dull and partly tympanitic on percussion. She complained of severe abdominal pain, and vomiting was frequent and slightly fæcal in character. The pulse was rapid and weak and the temperature 101° F.

A five-inch median incision showed a hernial sac containing a large mass of thickened and infiltrated omentum, which completely surrounded a piece of small intestine, six inches in length, inclosing it in a second omental sac.

The intestine was considerably congested and darker than normal, but regained its normal color on removing the constriction.

A mass of omentum of the size of two fists was ligated and removed. The patient did well for three days and then had a severe attack of œdema of the lungs which rapidly proved fatal.

Case V. *Large Congenital Cæcal Hernia; Radical Operation; Recovery.*—The patient, a boy sixteen years of age, had

a congenital hernia on the right side with rapid increase in size during the last six months. A truss had been tried but had proved ineffectual. At the time of operation there was present a tumor occupying the right half of the scrotum and extending up into the inguinal canal (three and a half by seven inches).

Operation, March 8, 1890.—On opening the sac, the cæcum, with a very short vermiform appendix, presented; and just below this was seen the testicle, slightly atrophied. The cæcum was dissected off from the posterior attachment, leaving a raw surface, two by three inches in area, not covered by peritonæum. This allowed the testis sufficient freedom to be drawn down into the scrotum.

There being no true sac, from the nature of the hernia, the outer layer of the peritonæum was sutured and the remainder of the wound closed in the usual way.

Recovery was prompt, and at the present time, thirteen months after operation, he has had no recurrence.

Case VI. *Large Irreducible Scrotal Epiplocele; Omentum Ligated; Secondary Inflammation of the Stump.*—The patient, a German, twenty-one years old, entered the hospital in February, 1890, with a scrotal hernia of the size of a cocoanut. He had been unable to reduce it for three months. At the operation the sac was found to contain a large mass of adherent omentum. This was ligated with strong silk at the neck of the sac and removed, the stump being returned into the abdominal cavity. During the fourth week a tumor of about the size of an orange appeared in the epigastric region. This was hard, exquisitely tender, and unmistakably intraperitoneal. The temperature rose to 101·5°, and the pulse became rapid and weak. The tumor increased in size and the symptoms in severity for two or three days, at the end of which time there was a gradual remission, and two weeks later they had entirely disappeared.

Case VII. *Large Irreducible Cæcal Hernia; Operation; Recovery; Subsequent Recurrence.*—J. D., a man, thirty-nine years of age, was admitted on May 17, 1890. He had had a hernia for four years, which had been reducible until a month previous to his entering the hospital. The right half of the scrotum was occupied by a large tumor extending up into the

inguinal region (twelve inches in its longest diameter). There was a distinct impulse on coughing, but the tumor could not be reduced. The upper portion was resonant and the lower dull.

A five-inch incision disclosed a sac containing the cæcum and about eighteen inches of the colon, which were bound by old and very firm adhesions to a large mass of omentum. There was no true hernial sac. The adhesions were separated with great difficulty, leaving large areas of raw surface. The hæmorrhage, which was free, was controlled by the cautery. The omentum was ligated and removed and the intestine returned to the abdomen. It was impossible to close the canal satisfactorily, for the hernia had almost entirely obliterated it. A large glass drain and iodoform tampon, extending into the abdominal cavity, were left in the wound.

Recovery was somewhat delayed by the sloughing of the scrotal portion of the sac, which in this instance was not removed. The patient has been kept under observation since. He had a recurrence shortly after the operation, and at present the hernia is of about half its former size and controlled by a truss.

Case VIII. *Strangulated Inguinal Hernia; Operation; Death.*—I. S., nine months old, male, was brought to the hospital on May 22, 1890, with the history of a swelling in the left groin since birth, increasing in size and finally becoming irreducible. Symptoms of strangulation developing, an operation was performed. A loop of small intestine an inch and a half in length was found in the sac. It was moderately congested, but soon regained its normal color on removing the constriction. The patient's condition was very bad at the time of the operation, but he rallied well under stimulants. On the following day the temperature rose to 105°. It continued high, and on the third day death ensued.

Case IX. *Strangulated Inguinal Hernia; Perforation of Intestine; Recovery.*—The patient, a man, sixty-five years of age, had had a hernia twenty years, which had become strangulated two days previous to his admission. At the time of the operation there was a tumor of the size of a hen's egg in the left

inguinal region. This was resonant on percussion and very tender. The whole abdomen was tympanitic and distended. The temperature was 100·4° and the pulse 136. The operation was performed soon after his admission. The hernial sac contained a small amount of bloody serum, together with a knuckle of small intestine about four inches in length. This was greatly congested, and one portion, about an inch in diameter, was of a very dark color and denuded of its peritoneal coat. A perforation was found in the center of this area, from which a small amount of fæcal matter escaped. The opening was closed with catgut sutures and the sac ligated high up and removed. The wound was closed by the usual method. Recovery, rapid and uninterrupted, followed.

Case X.—*Strangulated Inguinal Hernia; Hydrocele of the Cord; Operation; Recovery.*—The patient, a man, fifty-three years of age, was admitted on April 10, 1890. He had had a hernia for five years, which had been reducible until twenty-four hours previous to his admission. Symptoms of strangulation quickly developed, and an operation was performed soon after his entrance (operator, Dr. Coley). The right inguinal region was occupied by a tumor of the size of a cocoanut, dull on percussion, very tender, and not reducible with a moderate amount of manipulation. A three-inch incision over the canal exposed a sac containing about an ounce of clear serum. Posterior to this was a second larger sac containing a loop of small intestine, four inches in length, and a small quantity of dark, bloody fluid. The intestine was of very dark color, but became nearly normal after the constriction had been divided, and was returned to the abdomen. The first sac was not connected either with the hernial sac or with the tunica vaginalis, and was evidently an encysted hydrocele of the cord.

An uninterrupted recovery followed, notwithstanding the fact that the patient was very alcoholic.

The following table contains a summary of the remaining cases.

TABLE OF REMAINING CASES.

Diagnosis.	Age.	Sex.	Duration.	Size.	Truss.	Operation.	Wound healing.	Time in hospital	Drainage.	Remarks.
1. R. i.	17	F.	2 yrs.	Walnut.	None.	End of sac sutured in canal.	Primary union.	21 d.	Horsehair.	
2. L. f.	26	M.	6 yrs.	"	Truss.	Usual method.	" "	17 d.	"	Omentum tied off.
3. L. i.	33	M.	1 d.	Fist.	"	" "	Some suppuration; sinus.	60 d.	Two rubber.	
4. L. i.	33	M.	9 yrs.	"	"	" "	Primary union.	21 d.	"	" "
5. R. i.	19	M.	3 mo.	Egg.	"	" "	" "	13 d.	"	" "
6. R. i. (incarc. 4 days).	40	F.	5 yrs.	Walnut.	"	" "	" "	30 d.	Glass.	Four punctures made in gut.
7. L. i.	31	M.	2 yrs.	Egg.	"	Usual method; sutures and ligature all silk.	" "	15 d.	No drain.	Omentum ligated.
8. R. i., irreduc.	42	M.	12 yrs.	Fist.	"	Usual method.	Primary union; tube sinus.	70 d.	Rubber drain.	Omentum tied off.
9. F. h.	47	M.	8 wks.	Egg.	None.	" "	Primary union.	10 d.	Iod. gauze "	
10. L. i.	24	M.	8 mo.	Fist.	Truss.	" "	" "	15 d.	No drain.	
11. R. i.	21	M.	1½ yr.	Egg.	"	" "	" "	10 d.	"	
12. R. f., irreduc.	50	M.	2 yrs.	"	"	" "	" "	12 d.	Rubber.	Omentum tied off; subsequent inflammation of stump.
13. L. i.	25	M.	?	Fist.	"	" "	" "	65 d.	"	Omentum tied off; subsequent inflammation of stump.
14. L. i.	36	F.	6 yrs.	"	"	" "	" "	24 d.	"	

15. R. i.	20	M.	9 yrs.	Walnut.	Truss.	Usual method; undescended testicle.	Primary union.		41 d.	Rubber.	Testicle removed.
16. R. i., irreduc.	17	M.	10 yrs.	Fist.	"	Usual method.	"	"	18 d.	"	Double hour-glass contraction.
17. Double i.	34	M.	2 yrs. 1 mo.	Small.	"	" "	"	"	20 d.	Drain on one side, no drain on the other.	
18. R. f.	24	F.	2½ yrs.	Walnut.	"	" "	"	"	11 d.	Iod. gauze drain.	Omentum tied off.
19. R. i.	20	M.	5 yrs.	Small (canal only).	"	Neck of sac twisted and sutured in canal.			11 d.	No drainage.	Large mass of omentum tied off; subsequent inflammation of stump.
20. R. i., irreduc.	34	M.	Congenital.	Two fists.	"	Sac twisted and sutured in canal.	"	"	23 d.	Rubber.	Large mass of omentum tied off; subsequent inflam.
21. Double i.	11	M.	1 yr.	Very small.	"	Sac not found.	"	"	16 d.	No drainage.	
22. R. i.	20	M.	4 yrs.	Egg.	"	Sac twisted and sutured in canal.	"	"	12 d.	"	
23. R. i., irreduc.	32	M.	Congenital.	Fist.	"	Sac contained testicle; tunica shut off with catgut ligature.	"	"	12 d.	Rubber.	Omentum tied off.
24. R. i., complicated with hydrocele of cord.	55	M.	?	Small.	None.	Large hydrocele of cord with small hernia above.	"	"	11 d.	"	

OPERATIONS UPON THE THORAX.

(*a*) *Tumors of the Breast; an Analysis of Twenty Cases.*

Although the accompanying table contains a brief history of each case, the most important points may be summarized as follows:

I. *Classification.*—This is based upon the report of the pathologist, Dr. Ferguson, by whom a careful microscopical examination was made in every case.

Of the twenty cases analyzed, there were thirteen of carcinoma, three of adenoma, one of intracanalicular fibroma, two of sarcoma (one myxosarcoma), and one of tubercular lymphadenoma.

II. *Age.*—In the cases of carcinoma, all the patients were beyond the age of thirty-nine years, and all except two had borne children.

The patients with adenoma were forty-six, twenty-eight, forty-six, and forty years of age respectively. Those with sarcoma were forty-five and seventy-one years of age.

The myxosarcoma occurred in the former, the patient being a woman who had never borne children. There was a history of trauma fifteen years previously, followed by the appearance of a small tumor. The tumor did not increase in size, and remained free from pain until five months before operation, when, following a second injury, it began to grow very rapidly, and was accompanied by pain. At the time of operation it had attained the size of a large cocoanut. It was markedly protuberant, and, though having no actual pedicle, its base of attachment was comparatively small and did not extend beyond the limits of the normal breast. The skin over it was thin, tense, and glossy, and the subcutaneous veins were greatly dilated, giving it in portions a bluish discoloration. While for the most part hard, the consistence varied, and in several places it was soft and semi fluctuating. The growth was not adherent to the ribs, and its limits were very sharply defined. The lymphatic glands in the axilla were not enlarged. The operation was performed

on November 9, 1889. The tumor, breast, and a portion of the pectoralis major were removed. The wound healed by primary union, and the patient left the hospital at the end of eleven days. She was seen a year after the operation, and at that time was free from recurrence.

The remaining case of sarcoma occurred in a man seventy years of age (colored). It had existed four years, and began as a small painless nodule, just above and to the outer side of the left nipple. No history of injury could be ascertained. The tumor gradually increased in size, and two weeks previous to admission (May, 1890) it began to ulcerate and became painful. At the time of operation the region of the left breast was occupied by an irregularly spheroid mass, of about the size of an orange (ten inches in circumference). The skin over it was adherent and ulcerated in places. In consistence it was hard and nodular, and there were two or three tubercles of the size of an olive projecting from the main growth. There was no apparent involvement of the axillary glands. The operation, performed by Dr. Bull, May 3, 1890, consisted in an excision of the tumor and as much of the infiltrated skin as was possible without leaving a large open wound. No drainage was used, a dry dressing was applied, and the wound healed quickly by primary union. The axilla was not explored at the time of the operation, there being no apparent occasion for it. The patient was seen sixteen months after the operation and was in good health, and there was no evidence of local or general recurrence.

In the cases of carcinoma no history of trauma could be obtained in any instance, and in only one case was it possible to attribute the neoplasm to heredity. The same holds true of the cases of adenoma.

III. *Period of applying for Treatment.*—In the cases of carcinoma, one patient applied for treatment five weeks after the discovery of the tumor. The growth had attained the size of a goose egg and the axilla had already become invaded. This patient was fifty-three years of age and had borne children.

Another patient applied for treatment three months and a half after the growth had been first noticed. The tumor was of the size of an orange and the lymphatic glands in the axilla were enlarged.

The earliest period in the cases of adenoma was two months, while the average time in all cases was about one year after the discovery of the tumor.

The latest period was eighteen years.

This was a case of carcinoma, but the tumor had evidently been benign in character and stationary in its growth, and only during the last year had there been any marked increase in size.

The same is true of the case of myxosarcoma, where a tumor was noticed fifteen years before, but did not begin to grow or take on any signs of malignancy until five months before the operation. These two cases, in which a benign tumor had existed for a long period of years, and subsequently developed malignant features of the more marked type, illustrate the importance of early operation even in innocent growths.

Invasion of the Axilla.—In thirteen of the twenty cases the axillary glands were involved, and the microscope showed the enlargement to be due to carcinomatous infiltration. The axilla was free from disease in all the cases of adenoma, as well as in the two cases of sarcoma. The enlarged glands were detected by examination previous to the operation except in one case, where they were revealed by careful exploration of the axilla.

Diagnosis.—In the great majority of the cases the diagnosis was reasonably sure from the clinical history and the physical examination.

In four doubtful cases an exploratory incision was made through the tumor itself, and the nature and extent of the operation were determined by such exploration. In all of

the four cases the diagnosis was subsequently confirmed by the microscopical examination. In one case the tumor had been pronounced carcinoma by several well-known surgeons. The exploratory incision showed it to be probably a cystic adenoma, and the tumor alone was removed without sacrificing the breast itself.

General Plan of Operation.—(1) Removal of the tumor alone. (2) Removal of the breast, including the tumor. (3) Removal of the breast and axillary glands.

The tumor alone was excised in the cases of adenoma, the breast and tumor were removed in the cases of sarcoma, while in the carcinomatous cases the breast and axillary contents, with the tissues between them, were removed.

The operation was followed by recovery in every instance.

In the recent collection of Butlin (*vide Operative Surgery of Malignant Disease*, p. 387) an analysis of 311 cases shows a mortality of 9 per cent. in 141 cases where the breast alone was removed, and a mortality of 23 per cent. in 170 cases where the breast and axillary glands were removed. The usual elliptical incision was made, including breast and tumor, the long axis of the incision being in the direction of the fibers of the pectoral muscle. In those cases where the axilla was explored the incision was simply prolonged, and the skin covering the axillary vessels, the breast, and the enlarged glands were then removed entire.

The axillary vein was usually first exposed in order to lessen the danger of injury, and search made for glands between the pectoral muscles. In all instances the fascia of the pectoralis major, and occasionally parts of that muscle, were included in the portion removed.

General Wound Dressing.—All hæmorrhage having been carefully controlled, the wound was irrigated with a 1-to-

TUMORS OF THE BREAST.

Age and condition.	Duration of symptoms.	Position and size of tumor.	Heredity.	History of injury.	Operation.	Axilla invaded.	Drainage.	Wound healing.	Days in hospital.	Pathologist's report.
1. 46 yrs., s.	Tumor, 5 mos.; no pain.	L., size of an egg.	None.	None.	Ether; excision of tumor only.	No.	Horse-hair.	Prim. union.	5	Cystic adenoma.
2. 49 yrs., s.	Tumor, 6 mos.; little pain.	R., egg.	"	"	Ether; excision of breast and axillary glands.	Yes.	Glass and rubber.	"	12	Carcinoma.
3. 54 yrs., m. 15 children.	Tumor, 7 mos.; considerable pain.	R.	"	"	Ether; excision of breast and axillary glands.	"	Glass and rubber.	"	14	"
4. 28 yrs., s.	Tumor, 2 mos.; no pain.	L., English walnut.	"	"	Excision of tumor alone.	No.	Rubber.	"	7	Cystic adenoma.
5. 45 yrs., s.	Very small lump 15 yrs. ago; no increase in size until 5 mos.	L., cocoanut.	"	Injury, 11 yrs. ago; again, 5 mos. ago.	Excision of tumor and entire gland.	"	Rubber and glass.	"	11	Myxosarcoma.
6. 53 yrs., m.	Tumor, 5 wks.; no pain.	L., goose egg.	"	None.	Excision of breast and contents of axilla.	Yes.	Rubber and glass.	"	13	Carcinoma.
7. 49 yrs., m.	Tumor, 13 mos.; pain.	L., size of fist.	"	"	Excision of breast and axillary glands.	"	Rubber and glass.	Delayed union.	14	"
8. 49 yrs., m.	Previous operat'n 2 yrs. before, excision of breast; recurred in cicatrix 4 mos. ago.	R., old cicatrix size of two fingers.	"	"	Excision of cicatrix and as much as possible of new growth.	"	Rubber and glass.	Prim. union.	18	Recurrent carcinoma.
9. 46 yrs., m.	Tumor, 3 yrs.; no pain.	R., size of an orange.	"	"	Excision of breast and axillary glands (glands not enlarged).	No.	Rubber.	"	9	Cystic adenoma.

10. 45 yrs., m.	Tumor, 1 yr.	R., hen's egg.	None.	None.	Excision of breast and tumor with axillary glands.	Yes.	Rubber.	Delayed union.	18	Carcinoma.
11. 55 yrs., m.	Tumor, 3½ mos.; no pain.	L., size of an orange.	"	"	Excision of breast and axillary glands.	"	Glass and rubber.	Prim. union.	17	"
12. 40 yrs., m.	Tumor, 8 mos.; no pain.	L., size of an English walnut.		"	Exploratory incis., found to be cystic; only tumor removed.	No.	Rubber.	"	6	Intracanalicular fibroma.
13. 40 yrs., s.	Tumor, 8 mos.; pain 3 mos.	R., size of hen's egg.	"		Excision of breast and axillary glands.	Yes.	Rubber and glass.	"	16	Carcinoma.
14. 48 yrs., m.	Tumor, 2 yrs.; severe pain.	L., size of an orange.	"		Excision of breast and axillary glands; wound not entirely closed.	"	Rubber and glass.	Delayed union.	26	"
15. 71 yrs., m.	Tumor, 5 mos.	L., goose egg.	"	"	Excision of breast and axillary glands.	"	Rubber and glass.	Prim. union; tube sinus slow in closing.	37	"
16. 39 yrs., m.	Tumor, 14 mos.; discharge from nipple 6 wks.	R., hen's egg.		"	Excision of breast and axillary glands; dry, baked dressing.	"	None.	Prim. union.	9	"
17. 46 yrs., m.	Tumor, 2 yrs.; pain 2 mos.	L., no distinct tumor; area of induration slightly retracted.	Present	'	Exploratory incis. showed undoubtedly carcinoma; excision of breast and axillary glands.	"	Rubber and glass.	"	13	"
18. 75 yrs., m.	Small lump, 18 yrs.; increase in size past year; pain.	R., large egg.	None.	"	Excision of breast and axillary glands.	"	None.	"	12	"
19. 28 yrs., m.	Tumor, 1½ yrs.; two supernumerary breasts.	L., size of hen's egg.	"	"	Excision of tumor and axillary glands; breast not removed.	"	Glass.	"	10	Tubercular lymphoma.
20. 70 yrs., m.	Tumor, 4 yrs.; pain only recent.	L., fist.	"	"	Breast and tumor.	No.	None.	"	12	Sarcoma.

5,000 solution of bichloride of mercury, and the skin wound closed with catgut sutures of medium size. Two drainage-tubes were generally used, one of glass in the axilla and one of rubber in the most dependent portion of the breast wound. The external wound in the benign cases was usually closed with silk sutures (interrupted). In a few cases where it had been necessary to remove a large amount of skin, silver wire was used instead of silk.

Drainage.—In eleven cases glass and rubber drains were used; in two no drainage at all was employed. Both wounds healed by primary union—one in twelve and the other in nine days. In both cases the entire breast was removed. In the remaining cases rubber drainage-tubes were used.

Dressings.—The dressings employed in all except three of the cases were of gauze wrung out in a 1-to 5,000 solution of bichloride of mercury. Firm pressure was secured by means of rubber plaster, and either a binder or Canton-flannel bandage applied externally.

In three cases no antiseptic was used, the dressing being simply dry sterilized gauze and absorbent cotton, applied in the usual way. These wounds all healed by perfect primary union.

The drainage-tubes were in most cases taken out at the end of forty-eight hours.

Perfect primary union resulted in seventeen of the twenty cases, while in three cases the union, though mainly by first intention, was somewhat delayed by tube sinuses, which were slow in healing.

The average time spent in the hospital was thirteen days and eight tenths.

Below is given in full the report of the pathologist in Cases XII and XIX.

Case XII. *Intracanalicular Fibroma.*—The material is a small solid tumor with a cyst in its interior as large as a small

pea. The tumor is rounded in shape and measures 2 ctm. in diameter. There is apparently no capsule.

Microscopically, it is composed of fibrous tissue with an extension of the fibrous tissue into the dilated ducts and acini of the breast. These extensions of fibrous tissue are covered by cylindrical epithelium, the same as the breast gland ducts. At the periphery of the tumor there are normal breast acini and ducts, and many of these show also the effects of pressure from the developing tumor.

Case XIX. *Tuberculosis of Lymphatic Glands.*—The material consists of a number of glands forming a mass measuring $12 \times 8 \times 5$ ctm. and weighing one hundred and twenty grains.

On section it shows numerous areas of cheesy degeneration. On microscopical examination, the sections show many aggregations of small round cells with cheesy centers. There are extensive areas of necrobiosis with giant cells in places at their periphery. There are tubercles of all sizes in the involved glands.

(*b*) *Miscellaneous Cases.*

Case I. *Sarcoma of the Scapula; Excision of the Tumor; Death from Septicæmia.*—The patient was a woman, sixty-three years of age. There had been no malignant disease in other members of her family, and she had been well until ten months previous to admission. At that time, without apparent cause, she began to have slight pain and discomfort in the left axillary region, and two months later a tumor appeared over the outer border of the scapula. This grew rapidly, but never became tender or painful. At the time of operation, June, 1890, the tumor was of the size of a cocoanut, occupying the posterior axillary region and extending over the larger portion of the left scapula. The axillary glands were enlarged. The operation consisted in a six inch incision over the tumor and the excision of the tumor and enlarged glands. The tumor was very closely adherent to the subscapular fossa of the scapula, and had evidently originated in the periosteum. The wound was carefully irrigated with a 1-to-10,000 solution of bichloride of mercury, and drainage-tubes were used. The second day the tempera-

ture rose to 104° F., associated with considerable discharge and local redness about the wound. The symptoms of septic infection continued, and death followed on the ninth day.

There was no autopsy. The pathologist's report showed the growth to be a spindle-celled sarcoma.

Case II. *Osteoma of Ribs; Resection of Ribs and Pleura; Recovery.*—The patient was a woman, twenty-four years of age. Four years previous to the operation a swelling appeared below and to the outer side of the left nipple. This increased in size steadily, and was never painful. She entered the hospital in June, 1890, at which time she presented a tumor of the size of a cocoanut just below and external to the left nipple. The tumor was hard, nodular, and firmly attached to the chest wall. The skin was not adherent. Numerous small tumors, apparently similar in character, were found at the epiphyseal junctions of nearly all the long bones. Her general health was very good. The operation showed the tumor to be of bony consistence and so firmly attached to the third, fourth, and fifth ribs that its removal required the resection of about three inches of these ribs. The ribs in the region of the tumor were considerably softened. An opening was made in the pleura, and closed with catgut sutures. The external wound was freely drained.

Subsequent Progress.—She had a sharp attack of pleurisy on the day following the operation, the respirations rising to sixty a minute. The symptoms quickly subsided, and rapid recovery, with primary union, followed.

The pathologist's report showed the tumor to be an *osteoma*, of the consistence of cancellous bone structure, and covered with cartilage. The tumor weighed eleven ounces and a half.

Case III. *Deep Sinus of Chest following Operation for Empyema; Resection of Five Ribs; Recovery.*—The patient, a man, twenty-nine years of age, had been operated upon for empyema six months before. A sinus, with considerable discharge, persisted, and his general condition was much impaired.

In October, 1889, the sinus was freely laid open the entire length, and portions of the fourth, fifth, sixth, seventh, and eighth ribs, varying in length from one to two inches, were removed. The sinus itself was thoroughly scraped and the wound

closed. Primary union followed, and his general condition rapidly improved.

Case IV. *Foreign Body in the Bronchus; Operation; Removal; Recovery.*—The patient, a child two years old, entered the hospital in November, 1889. On admission, her temperature was 104° F., respiration 68, and pulse 150.

Five days before, she had swallowed a black-headed pin, and almost immediately was seized with a severe coughing fit. Frequent paroxysms of coughing had followed and had continued up to the time of her entering hospital.

Physical examination showed vesicular breathing on the right side much diminished, and crepitant râles over right lung

Chloroform was given and tracheotomy below the isthmus of the thyreoid performed. The point of the pin was quickly discovered, and the pin removed with forceps. It measured two inches and a quarter in length, and the head was of the size of a pea. It had lodged in the right bronchus. The wound quickly healed, and rapid recovery followed.

The remaining cases are not of sufficient importance to be given in detail. Two operations were for axillary abscess, two for necrosis of ribs, and one for abscess of the chest wall.

OPERATIONS UPON THE HEAD.

(*a*) *For Traumatism.*—Although the number of cases here reported is small, they all go to swell the evidence that has been collected during the past ten years in favor of the *early* use of the trephine in *all* cases of depressed fracture of the skull. Surgical authority upon this important question has varied greatly during the past century. While in the early part of the century the pendulum swung so far in the direction of "active interference" that many of the best surgeons believed that trephining was absolutely necessary in cases of simple undepressed fracture to prevent consequent intracranial inflammation, in less than fifty years the reaction was so great that the operation became almost unknown in

OPERATIONS UPON THE HEAD, FACE, AND NECK.

SEVENTY-FIVE CASES.

		Recovered.	Died.
(*a*) Operations upon the Head:			
Compound depressed fracture of skull.	2	2	..
Congenital elephantiasis of scalp and face.	1	1	..
For epileptoid convulsions, dependent on old fracture of skull (two operations)	1	1	1
(*b*) Operations upon the Face:			
(1) Neoplasms	14	14	..
Carcinoma of tongue	3	3	..
" " lip	7	7	..
Recurrent fibromata of ears	1	1	..
Pachydermatocele of face, congenital (two operations)	1 1	1 1	.. ..
Angeioma of submaxillary gland	1	1	..
Myxo-sarcoma of parotid gland	1	1	..
(2) Deformities.			
For hare-lip	3	3	..
" " single	1	1	..
" " double complicated	2	2	..
Plastic, for cicatricial contraction of neck	1	1	..
" " deformity of nose	3	3	..
Plastic, for syphilitic perforation of hard palate	1	1	..
Plastic, for ectropion	2	2	..
(*c*) Operations upon the Neck:			
Tumors of the thyreoid	3	3	..
Tubercular lymphadenoma	5	5	..
Lipoma	1	1	..
(*d*) Miscellaneous	7	7	..

many of the larger hospitals, and in 1867 it had not been performed at St. Bartholomew's for six years. It gradually became more and more an operation which was resorted to only in the most severe and often hopeless cases, and the resulting high mortality told more and more against its general adoption. It has been only recently that the operation has again come into prominence, and even now many surgeons would refrain from operating unless pronounced brain symptoms were present. The three cases

here presented illustrate the two methods of treatment. In two cases immediate operation was performed and prompt recovery followed. In the remaining case there had been a compound depressed fracture six years and a half before. There being no marked brain symptoms, no operation was performed. Epileptoid convulsions soon developed and continued at short intervals until death, which followed an attempt to remove the cause of the convulsions—viz., a cyst dependent upon an old intracranial inflammation. The early operation is performed with ease and comparative safety, provided aseptic precautions are carefully observed, while the late operation, aside from being vastly more difficult to perform and more dangerous to life, furnishes but a small prospect of relieving the patient.

Although Bryant (*Practice of Surgery*, p. 185) gives the mortality of the operation at Guy's Hospital as 76 per cent. in 51 operations during a period of seven years, this should by no means be considered a proper estimate of the seriousness of the operation. At that time only in the worst cases were the patients trephined, and, as many of them probably had extensive laceration of brain tissue, the mortality was necessarily high. On the other hand, Dr. Stimson collected 13 cases of operations done in a single year (1880–'81) at Bellevue Hospital. Ruling out a gunshot fracture (with the bullet buried in the brain) and a second case where the fracture was not discovered until an abscess of the brain had formed, there remain 11 cases, nine of which recovered. This gives a mortality of only 18 per cent. In seven of the cases collected by Dr. Stimson there were no brain symptoms beyond stunning. All of these seven patients recovered.

In addition to the cases here reported, I recently operated upon a man at Port Jervis, who walked into the office with a small scalp wound in the anterior right parietal

region. He had been working in a quarry, and a small stone had fallen from above, striking him upon the head. He was slightly stunned at first, but soon recovered and had absolutely no symptoms when I saw him. A careful examination showed a small punctate fracture with an area about three eighths of an inch in diameter slightly depressed. On removing a button of bone (half inch trephine) and slightly enlarging the opening with bone forceps, there was found a fracture of the inner table much more extensive than of the outer, and the depression was much more marked. Here was a condition that would almost certainly have caused subsequent trouble had no operation been performed, and yet symptoms were absent. Recovery was prompt, the wound healing by primary union, and at the end of ten days he resumed his work.

(*a*) Head. Case I. *Compound Depressed Fracture of the Skull; Trephining; Recovery.*—C. W., male, thirty-eight, colored, waiter. Admitted March 30, 1890, two hours after having been struck on the head with a heavy water-pitcher. He was conscious on admission, but soon became comatose. There was a scalp wound just to the right of median line and an inch behind the edge of the hair, and at its bottom a "gutter-shaped" fracture an inch and a half long by three quarters of an inch wide, with depression of a quarter of an inch in the center. Under ether the wound was enlarged, a button of bone an inch in diameter removed, and the opening enlarged with rongeur forceps by Dr. Coley. Suture with horsehair drain, which was removed on the third day. Primary union without fever. Discharged on the eleventh day.

Case II. *Compound Fracture of the Skull, with Subdural Hæmorrhage; Trephining and Removal of Clot; Recovery. (Complicated with Transverse Fracture of the Astragalus.)*—P. D., nineteen, male, brought by ambulance immediately after falling one story and striking on head, May 2, 1890. There was a lacerated and contused scalp wound an inch long in right frontal

and parietal region, with longitudinal fracture, one edge slightly depressed. He was delirious, with frequent well-marked left unilateral convulsive movements, with increasing unconsciousness. Two hours after the injury, trephining under ether was performed by Dr. Coley, through a curved incision three inches and a half in length. After removal of a button (half an inch in diameter) and enlarging opening upward and backward with bone forceps, the dura mater was found more bulging than normal, and a hypodermic-syringe puncture drew fluid blood. Incision (one inch) through dura mater evacuated a small clot and some fluid blood, cortex of brain not being injured. The dura was sutured with fine catgut, the scalp wound closed with same. A horse-hair drain was used and removed the fourth day. Primary union; no fever. For several days there was delirium and semi-coma, which gradually disappeared, and recovery was complete at the end of one month. The fracture of the astragalus was kept in gypsum splint for three weeks. It could not be perfectly reduced, there being slight projection forward and inward, with inversion of the foot and stiffness of the ankle. He is now, one year after the operation, perfectly well, but a trifle lame from the fracture of the astralagus.

Case III. *Traumatic Epilepsy from Fracture of the Skull; Trephining and Incision of Old Meningeal Hæmatocele; Relapse; Excision of Portion of Cortex of Brain One Month Later; Death from Hæmorrhage and Encephalitis.*—F. K., twenty-one, male, admitted March 17, 1890. He had been well until six years and a half ago, when he received a blow from a stone upon the right side of the head, causing a compound depressed fracture. No operation was performed, and the wound healed promptly. Shortly after the injury, however, left unilateral convulsions developed, involving muscles of neck, arm, and lower extremity. These attacks recurred at short intervals, usually from ten to fourteen days, and during the attacks consciousness was generally lost. His general health remained good, and his mental condition was but slightly affected. Examination at the time of entrance showed paralysis of the left depressor anguli oris, with some weakness of the risorius. The tendon reflexes were normal, and there was no defect in gait. Ophthalmic examination was negative. In the middle of

right parietal region there was a cicatrix three inches and a half in length, with slight apparently bony depression just beneath it.

Operation, March 22, 1890.—Ether. A curved incision four inches in length revealed a space $\frac{1}{8} \times \frac{3}{8}$ of an inch at center of cicatrix where the bone was absent, the dura mater and pericranium coalescing. A small puncture was followed by the escape of a clear straw-colored fluid. A one-inch trephine was then applied to the depressed area, and the opening subsequently enlarged with bone forceps. A cyst three quarters of an inch in diameter was found. The contents were removed and the wound packed with iodoform gauze.

The wound healed quickly by granulation. Ten days after the operation a slight convulsion occurred, and the following day a very severe one, accompanied by rapid pulse. Temperature 103° F., and deep coma lasting half an hour.

It was decided to operate again, and, if possible, remove the cyst wall. The second operation was performed on April 24th, four weeks after the first. The skull opening was enlarged, the recent granulations scraped away, and the cyst wall, together with considerable dense cicatricial tissue, was removed, leaving a cavity in the brain about the size of a hen's egg. The hæmorrhage was very profuse and could only be controlled by a large tampon of iodoform gauze. The loss of blood was considerable, and the condition of the patient at the close of the operation was extremely critical, but improved somewhat under free stimulation. He was comatose during the night. The following day temperature rose to 103·6°, the pulse was 140, and consciousness (imperfect) returned. There was total paralysis of the left arm and leg, and this remained until death.

On the second day he again became unconscious, slight unilateral convulsions (left) developed, and became more and more frequent. His temperature rapidly rose, and death occurred forty-eight hours after the operation.

NEOPLASMS.

There are eighteen cases of neoplasm, including face and neck. These are given in tabular form, but a number deserve further mention.

Fig. 4.

Age and sex.	Duration of symptoms; region.	Size of growth.	Enlarged glands.	Hered'y tendency.	Operation.	Time in hospital	Wound healing.	Pathologist's report.
1. 56 yrs., male.	1½ yr.; lower lip.	¾ inch diameter.	None.	None.	V-shaped incision; silk and silver-wire sutures. Ether.	5 d.	Primary union.	Epithelioma.
2. 45 yrs., male.	2½ yrs.; lower lip.	Half lower lip.	Glands enlarged.	"	Rectangular flap; removal of two enlarged glands. Ether.	9 d.	" "	Epithelioma, recurred in 4 mos.
3. 62 yrs., male.	Tongue.	Whole dorsum of tongue anterior.	Glands enlarged.	"	Ligature of both lingual arteries; tongue then drawn forward and cut off at base; little hæmorrhage. Ether.	21 d.	Wound healed rapidly.	Epithelioma.
4. 88 yrs., male.	3 mos.; tongue.	Right side of tongue.	Glands enlarged.	"	Ligature of right lingual artery; tongue drawn out and right half removed; hæmor. slight. Ether.	6 d.	Wound healed rapidly.	"
5. 37 yrs., male.	7 yrs.; left side nose and face.	Round ulcer, ¾ inch diameter.	None.	"	Excision and plastic. Ether.	21 d.	Healed by granulation.	"
6. 65 yrs., male.	Op. 4 yrs. prev., epith. of lip; recur. 4 mos. ago.	Angle of jaw; ulcer; 1 in. in diameter.	"	"	Excision and plastic. Cocaine.	17 d.	Primary union.	"
7. 63 yrs., male.	Op. epith. of lip, 3 mos. prev.; recur. in glands.	Small lump in submaxillary triangle.	Yes.	"	Excision. Ether. Mar. 15, 1890.	15 d.	Healed slowly.	"
8. 56 yrs., male.	Upper lip; 4 mos.	¾ × ½ inch.	None.	"	Ether. Excision.	18 d.	Salivary fistula left; closed by second operation.	"
9. 16 yrs., male.	Congenital; right side face, eyelid, scalp.	.....	"	"	Ether. Excision.	53 d.	.....	Elephantiasis

10. 22 yrs., female.	6 yrs.; followed piercing of ears; op. 2 yrs. ago. Recurrenee.	Size of e'iest-nut; lobes of both ears.	None.	None	Ether. Excision.	5 d.	Primary union.	Fibromata.
11. 63 yrs., male. (No. 7.)	Op. Mar. 15, 1890; second recur. of old cicatrix.	Small nodule; submax. reg.; old cicatrix.	"	"	Ether. Operation June 4, 1890.	8 d.	" "	Epithelioma.
12. 42 yrs., male.	27 yrs.; submax-illary region.	Size of English walnut.	"	"	Ether. Excision; closely adherent to submaxillary gland.	11 d.	Wound was packed and allowed to heal by granul'n.	Angeioma.
13. 58 yrs., male.	1 yr.; tongue.	$\frac{1}{4} \times \frac{3}{4}$ inch.	Yes.	"	Ether. Ligature of right. lingual artery and excision of right half of tongue.	17 d.	Wound healed promptly.	Epithelioma.
14. 46 yrs., male.	$2\frac{1}{2}$ yrs.; lip; prev. op. Nov. 3, 1889; recur. 4 mos.	Size of English walnut; sub-max. region.	"	"	Ether. Operation Mar. 19, 1890. Free excision, with resection of 2 in. of internal jugular vein.	12 d.	Wound healed quickly, but there was prompt re-currenee.	"
15. 18 yrs., female.	5 yrs.; painful, parotid gland.	Size of English walnut.	None.	"	Ether. Tumor found attached to parotid; it was carefully dissect-ed out.	5 d.	Perfect primary union.	Mixed tumor (fibro-myxo-sarcoma).
16. 47 yrs., female.	18 yrs.; no pain; thyreoid.	Egg.	"	"	Ether. Enucleation and removal, including major part of thyreoid.	12 d.	Primary union.	Adenoma.
17. 29 yrs., female.	7 yrs.; thyreoid.	Fist.	"	"	Ether. Superior and inferior thy-reoid arteries ligated; tumor dis-sected out small part; thyreoid left.	20 d.	" "	Colloid goître.
18. 20 yrs., female.	15 mos; thyreoid.	Hen's egg.	"	"	Ether. Tumor encapsulated; re-moved; contained left lobe of thyreoid.	30 d.	" "	Angeio-sarco-ma.

Case I. *Epithelioma of the Lip, strongly simulating Sarcoma; Recurrence.*—H. B., aged forty-five, male, admitted November 1, 1889. His family and personal history was good. He had been an habitual smoker. Two years and a half before, a small, hard swelling had appeared on the right side of lower lip. This grew very slowly until four months before admission, when it began to ulcerate and increase rapidly in size. The glands beneath jaw were swollen and tender. At the time of operation one half of the lip was removed, and the extensive wound closed by means of a large rectangular flap extending back to the angle of the jaw. (Fig. 4.)

Although the clinical history, as well as the appearance of the tumor, pointed strongly toward epithelioma, a very careful microscopic examination was made by the pathologist, and it was reported to be sarcoma. In view of the subsequent history of the case, it may be interesting to note the report in detail. "Microscopically, the tumor is composed of many spindle cells, round cells, flat cuboidal cells, and many giant cells. Bundles of spindle cells run in different directions throughout the tumor. The round cells are not to be distinguished from the young cells of inflammation. The giant cells are small and contain from three to ten nuclei. The vessels are abundant and thin walled."

Second Operation, Two Months Later; Excision of Submaxillary Glands; Resection of the Internal Jugular Vein; Recovery.—The recurrence was confined to the submaxillary and deep cervical glands; owing to extensive inflammatory action, the dissection was very difficult. The facial artery and vein were cut and tied on both sides, and an enlarged gland was so closely adherent to the internal jugular vein (right side) that two inches of the vein were resected. The lower end of the excised portion was just above the edge of the clavicle. The wounds healed promptly, but a second recurrence soon followed and proved fatal three months after the operation. Microscopical examination of the material showed the disease to be unquestionably epithelioma, which had at first been so disguised by the inflammatory action that it was mistaken for sarcoma.

Congenital Elephantiasis of the Face and Scalp; Operation; Recovery.—A. P., aged sixteen years, United States, male, admitted April 12, 1890. Family history good. Patient was slightly under size, and mental development considerably below par. He had congenital hypertrophy of the face, eyelid, and scalp, confined to right side. The right eye had become diseased in early childhood and had been removed. The general aspect of face strikingly resembled that of a dog's face, and it is a curious fact that while the mother was pregnant (during the early months) she worked almost constantly for several weeks upon a "dog puzzle." He had six brothers and sisters—all well developed, both mentally and physically.

Examination showed the whole of right side of the face greatly hypertrophied and the features distorted. The hypertrophy seemed to be confined chiefly to the skin and subcutaneous tissue. The right eye was absent and the upper eyelid very greatly thickened and pendulous, reaching down to the upper border of the ala nasi. There was a well-marked, irregular depression in the region of the squamous portion of right temporal bone, and in one place a slight loss of bony substance. The upper jaw showed absence of teeth on the right side, beyond the second incisor. Over the posterior portion of the right parietal bone there was a soft, flabby tumor of the scalp about the size of a small hen's egg, freely movable, and covered with a normal growth of hair (see Fig. 5).

Operation, April 19, 1890.—Ether. An incision was made just below the border of the cyclashes of the hypertrophied lid and the skin dissected up as far as the eyebrow. The redundant portion beneath was then dissected away from the conjunctival membrane and the skin and conjunctiva sutured at lower edge with fine silk. The tumor of the scalp was then removed by means of an elliptical incision, the wound partially closed, and the remainder left to granulate. The face was left for subsequent operation. Both wounds healed promptly, and the appearance of the eyelid was greatly improved.

Second Operation, May 3, 1890.—Ether. An elliptical incision was made from the angle of the mouth nearly to the ear, including the larger portion of the redundant tissue (three inches

at its greatest width). The incision was carried entirely through the mucous membrane into the mouth. The edges of the mu-

Fig. 5.

cous membrane were then sutured separately with catgut and the skin with silk sutures. The bleeding was profuse but easily

controlled. Extensive œdema and swelling followed the operation, but soon subsided on relieving the tension and applying wet antiseptic dressings. Wound healed slowly, and on June 4th patient left hospital markedly improved.

Angeio-sarcoma of the Thyreoid.—A. D., aged twenty, single female, birthplace Ireland. Family history good. Admitted March 6, 1890, with the following history: General health had always been good. About fifteen months ago she first noticed a swelling of the neck. This has gradually become larger in spite of repeated injections of iodine. At time of entrance to hospital there was a mass about the size of a hen's egg situated a little to the left of the middle line of the neck and on a level with the thyreoid.

Operation, March 15, 1890.—Ether. An incision three inches long was made over the tumor and the inferior thyreoid artery found and ligated. The superior was not seen. The tumor was encapsulated, and evidently contained the left lobe of the thyreoid. It was removed with little difficulty and the bleeding was not profuse. Heavy dressing with carefully adjusted pressure pads secured perfect primary union.

Pathologist's Report.—Plexiform angeio-sarcoma.

Adenoma of the Thyreoid.—A. S., aged forty-seven years, female, birthplace France. Family history good. About eighteen years ago tumor appeared in region of the thyreoid. It gradually increased in size and at the end of two years was operated upon and partially removed. No recurrence until July, 1888, when a similar swelling appeared in the same region, which has since increased in size.

Admitted August, 1889. Examination showed a tumor of about the size of an egg situated just above the sternum not attached to trachea, nodular or rather lobulated, and the skin over it smooth and glistening.

Operation, August 31, 1889.—Ether. The tumor was found to consist of two masses, each about the size of an egg, evidently originating from the right and left lobes of the thyreoid. These were carefully enucleated and removed. The hæmorrhage was not severe. Small rubber drainage-tubes were left in until the sixth day. There was some pain and a little difficulty in swal-

lowing, but only for a short time. The wound healed by first intention and patient left the hospital the twelfth day after operation.

Pathologist's Report.—Adenoma of the thyreoid gland.

Colloid Goitre.—E. E., aged twenty-nine, birthplace England, single, servant. Admitted on October 24, 1889. Family history tubercular.

The patient first noticed the enlargement of the neck seven years ago. It increased very slowly in size at first, but more rapidly the last year. Troubled with headache and bulging sensation in eyes. Examination showed a mass the size of a man's fist, irregular, lobulated, and occupying the central portion of the neck anteriorly and reaching nearly to the sternum. This did not seem attached to the trachea.

Operation, October 26, 1889.—Ether. An incision two inches and a half long was made in the median line, and the superior and inferior thyreoid arteries having been found and ligated on either side, the tumor, consisting of three lobes, was then dissected out, leaving behind a portion of the central or smallest lobe. The hæmorrhage was easily controlled. A rubber drainage-tube was left in the wound, and a heavy dressing, with considerable pressure, applied. Pulse and temperature were high during the first four days (temperature, 102° to 104°), but after these soon fell to normal. The wound healed chiefly by primary union, but the tube sinus was somewhat slow in closing.

DEFORMITIES.

Case I. *Double Congenital Hare-lip, complicated with Cleft Palate.*—A. Z., aged five months, male. Operation on October 12, 1889.

A well-marked protrusion of the intermaxillary bone added greatly to the difficulty of making a satisfactory closure of the cleft. The projecting portion of bone was removed, the edge of the cleft freshened, and the lip sufficiently freed from its attachment to allow the flaps to be brought into apposition without too great tension. Silver-wire and silk sutures were used in preference to hare-lip pins. The sutures were removed on the third day; some suppuration followed on one side, causing healing by granulation.

Case II.—*Double Congenital Hare-lip with the same Complications as the in preceding Case.*—A. G., male, aged two months. The child was very badly nourished. The defect was so great that the child was unable to obtain a proper amount of food either from the breast or bottle, and for this reason the operation was performed earlier than it otherwise would have been. The cleft on either side extended to the nostril, and a large snout-like process projected between the clefts. The operation, though more extensive, did not differ materially from the one already described. It was, however, only partially successful, as some of the sutures cut through on one side. The child developed scarlet fever, and had to be transferred before a second operation could be performed.

Case III. *Single Congenital Hare-lip, uncomplicated.*—Operation August 29, 1889. Pins removed on fourth day. Perfect primary union.

Deformity of the Nose.—M. M., aged twenty-two, female. The patient had a congenital deformity of the nose, consisting of an abnormally broad tip, notched in the center, giving it a slightly bifid appearance. At the first operation an incision about an inch long and a quarter of an inch deep was made in the central line, and then a thin layer of tissue removed from each side. The parts were then brought together and held in place by a silver-wire suture and lead clamps, with superficial sutures of fine silk.

The wound healed by primary union, and the improvement was very marked; but, as the tip was still a little too broad, more tissue was removed from the center at subsequent operations, almost entirely doing away with the deformity, and leaving a scarcely noticeable scar.

Plastic Operation for Ectropion (Two Cases).—W. H., aged ten years, admitted January 18, 1890. Nine years before, the patient fell upon a chair, cutting a deep gash just beneath the right eye. Examination at entrance showed the right lower eyelid markedly everted, with half an inch of conjunctiva exposed. Just below this was an old cicatrix firmly adherent to the bone, and in the center of the cicatrix was a small, round depression or sinus.

Fig. 6.

Operation, January 23, 1890.—Ether. The cicatrix was dissected up, a curved incision having first been made below the ciliary border, and the edge of the lower lid was then drawn up and held by temporary sutures in forehead. A lateral flap was then taken from the temporal region and brought down to fill the space left vacant by raising the lower lid. Horsehair drain. Result satisfactory.

Wound healed promptly by first intention, and deformity was greatly diminished.

Second case; similar operation; result less satisfactory.

A case of syphilitic perforation of soft palate; plastic operation.

One operation for cicatricial contraction of neck.

Five operations for tubercular lymphadenoma of neck.

One operation for lipoma of neck.

Seven miscellaneous cases of too little importance to be given in detail.

REMARKS ON NEOPLASMS.

An analysis of the cases shows that of the eight operations for epithelioma of the lip, five were for recurrent and three for primary disease. In the three primary cases the duration of the tumor had been four months, a year and a half, and two years and a half, respectively. In one case the new growth was situated in the *upper* lip, which is a comparatively rare occurrence. In one case of primary epithelioma of face and nose the tumor or ulcer had existed seven years.

In one of the recurrent cases the primary growth had been removed from lower lip four years before, and the patient had been free from the disease until four months previous to entering the hospital. The recurrence took place not in the usual situation—viz., the sublingual or submaxillary glands—but in the skin of the face just above the angle of the jaw, forming a characteristic epitheliomatous ulcer about an inch in diameter.

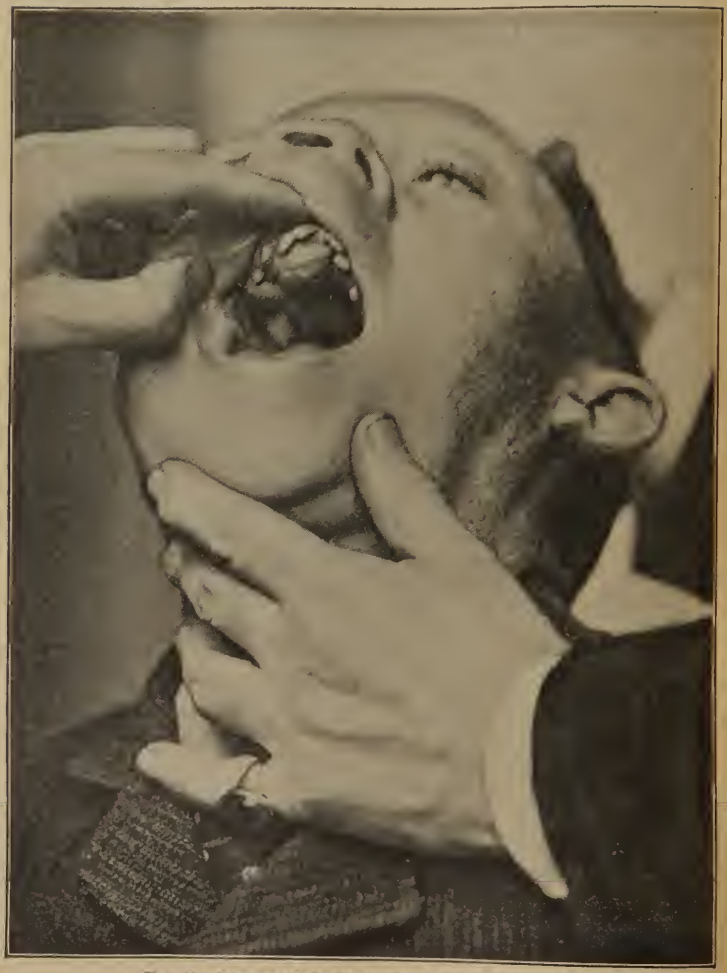

FIG. 7. Congenital elephantiasis of face. , See page 69.

Tongue.—In two cases only half of the organ was removed, and in one the entire tongue. The method of operation adopted was the same in all the cases—the lingual artery on the corresponding side being first found and ligated, the tongue was then drawn forward and partially or entirely removed at base with scissors. Hæmorrhage was slight in all of the cases, and recovery was prompt and satisfactory, although the patient in one case was eighty-eight years of age. Heredity was absent in every case, including tumors of tongue, lip, and face, and a source of irritation—*e. g.*, pipe or sharp tooth—was found in only a small number of cases.

The age in the cases of epithelioma ranged from forty-five to eighty-eight years, the average being fifty-eight. Enlarged glands were present in only four cases.

The method of operation employed in the ordinary cases of epithelioma of the lip was by the V-shaped incision, care being taken not only to include the new growth itself, but a margin of healthy tissue one third of an inch in width.

Where the disease was extensive the rectangular flap was used in preference to the V-incision. The edges were generally secured in apposition by means of one or two silver-wire sutures or hare-lip pins supplemented with additional sutures of fine silk. The wire was usually removed at the end of forty-eight hours.

Subsequent History.—Sufficient time has not yet elapsed to enable one to determine how many permanent cures have been effected. The cases have all been followed, and, with one exception, the patients are still living. The one referred to was operated upon the first time in November, 1889, and again for extensive glandular recurrence in March, 1890. The disease again quickly recurred and proved fatal three months later.

The most complete statistics as to the after-history of

epithelioma of the lip are found in Butlin's work on the operative surgery of malignant disease. Of the 424 cases that he has collected, chiefly from the German clinics of Billroth, Bruns, and Thiersch (the history of which had been followed), 160 had passed the three-year limit, showing 38 per cent. of cures.

Although the three-year limit is the one generally adopted by surgeons, the case just referred to, where recurrence took place three years and eight months after operation, shows that it is not absolutely correct.

In regard to removal of the glands, some of the German surgeons, and particularly Bruns, have recently advocated removal in all cases, whether enlarged or not. Thus far the number of cases where this method has been adopted is too small to permit any satisfactory conclusions being drawn.

In the cases here reported the glands were not interfered with unless they could be felt.

In regard to the other cases, the myxo-sarcoma of the parotid gland is sufficiently rare to deserve mention. The tumor occurred in a girl of eighteen years, and had been in existence five years previous to operation. It had reached the size of an English walnut, was encapsulated, and had always been accompanied by more or less pain. It was found at the operation to be connected with the parotid gland. The microscopic examination proved it to be a myxo-sarcoma. The case not only is interesting on account of the small number that have been reported (twenty-nine),* but it furnishes additional evidence as to the peculiar characteristics of sarcoma of this region—viz., the slow growth and comparative benignity of the disease.

Of the twenty-nine patients treated by operation, eleven have passed the three-year limit and eighteen were alive and well, with no signs of recurrence, at periods rang-

* Butlin, *ibid.*

ing from a year and a quarter to eight years after operation. Three were known to have recurrence, and the rest were lost sight of.

Tumors of the Thyreoid.—In regard to these there is little to be added to the report of the cases. The operations, or rather the results, show that extensive tumors can be removed from this region without great danger from hæmorrhage. After ligation of the superior and inferior thyreoid arteries before removing the gland the bleeding was trifling. Primary union followed in every case, but care was taken to apply the dressing with proper pressure over the region of the gland.

CLASS IV.—OPERATIONS UPON THE RECTUM AND ANUS.

The cases in this class may be summarized as follows:

(*a*) *Fistula in Ano.*—Fourteen cases. Tubercular origin probable in ten cases.

Treatment.—Free incision, curetting, and packing the wound with iodoform gauze. The bowels were kept closed for four or five days, at the end of which time a mild saline cathartic was given and the wound repacked. As soon as granulation had begun the wound was dressed daily with balsam of Peru, and occasionally stimulated with silver nitrate or zinc sulphate. The average time in the hospital was two weeks and a half.

(*b*) *Internal Hæmorrhoids.*—Ten cases. The method of treatment employed in all cases was partial excision and ligation.

(*c*) *Ischio-rectal Abscess.*—One case.

(*d*) *Ulcer of the Rectum.*—Two cases.

CLASS V.—GENITO-URINARY.

Total number of cases, fifty-seven. Recoveries, fifty-seven. Male patients, thirty-eight; female, nineteen.

A. Males. (*a*) *Urethrotomy for Stricture of the Urethra.*—Eighteen cases. Internal, nine; external and internal, nine. The internal method was employed in all cases where the stricture was situated in the anterior portion of the urethra. Where it was beyond from four and a half to five inches deep, the external incision was made and a catheter left in the bladder from twenty-four to forty-eight hours after the operation. The urethra was generally enlarged so as to easily allow of the passage of a No. 30 (French scale) steel sound.

The bladder was washed out with boric-acid solution at the close of the operation. The hæmorrhage was usually slight, but in one or two cases required the pressure from a steel sound which was allowed to remain in the urethra for a short time.

After-treatment.—The passage of sounds was begun on the fourth day and continued every second day until the patient left the hospital.

The reaction following operation was slight, and recovery followed in every case. The patients on whom the internal operation had been employed left the hospital at the end of a week or ten days, but they were advised to continue passing the sound.

(*b*) *Varicocele.*—Seven cases, seven recoveries. Method of operation, incision and ligation. In some cases where the mass of veins was very large a portion was resected, but in the ordinary cases simple incision and ligation was the method adopted. The veins were ligated separately, rarely *en masse*. The wound was packed with iodoform gauze. Primary union followed in every case, and the results were satisfactory. The average time in the hospital was eight days.

(*c*) *Congenital Phimosis.*—Six cases, six recoveries. Circumcision by the clamp method was done in all of the

cases. Ether was given in most cases, but in some the operation was performed under cocaine anæsthesia.

(*d*) *Hydrocele.*—Two cases, two recoveries. Operation, Volkmann's. Recovery was rapid and there were no complications.

Miscellaneous cases, five; recoveries, five.

1. Tuberculosis of the testis; castration.

2. Epithelioma of the penis and inguinal glands; amputation of the penis.

3. Suprapubic lithotomy.

4. Suprapubic cystotomy for papilloma of the bladder.

5. Carcinoma of the testis; castration.

These cases are all of sufficient interest to deserve further mention. The histories, in brief, are as follows:

GENITO-URINARY.

Case I. *Tubercular Testis; Castration.*—T. N., thirty-eight years of age, was admitted October 29, 1889. He had had gonorrhœa twelve years before. Five years before he first noticed a slight enlargement of the right testis, with gradual loss of testicular sensation and dull pain in the cord. Two months and a half before, the skin broke down, forming an unhealthy ulcer with irregular, undermined edges. At the time of operation the testis was of twice the normal size, and the skin not adherent, except at the site of the ulcer, which was an inch and a half in diameter.

Operation, November 2, 1889.

Castration.—Speedy recovery followed. The pathologist's report showed the testis to be the seat of well-advanced tuberculosis.

Case II. *Epithelioma of the Penis and Inguinal Glands; Operation; Recovery.*—W. T., fifty-eight years of age, was admitted May 7, 1890. His general health had always been good and he had never had venereal disease. He had congenital phimosis. Two years before, a small wart-like growth appeared on the glans near the corona. This continued to grow until the

time of the operation, when it was of the size of a hen's egg. The surface had ulcerated over a large area and the discharge was considerable. The edges were indurated, and the glands in both inguinal regions were enlarged.

Operation, May 7, 1890.—Amputation of the penis was performed three quarters of an inch from the symphysis pubis, and the inguinal glands were carefully dissected out. A catheter was allowed to remain in the bladder for the first twenty-four hours, after which time micturition was voluntary and painless. The examination by the pathologist showed both the penis and the inguinal glands to be epitheliomatous.

Case III. *Vesical Calculus; Suprapubic Lithotomy; Recovery.*—M. C., aged twenty-six, male, was admitted September 23, 1889. He had had symptoms of bladder irritation since childhood. Examination with a steel sound easily detected a calculus which was apparently about an inch in diameter.

Operation, September 25, 1889.—The urine was drawn off and twelve ounces of warm boric-acid solution were introduced into the bladder; an equal amount was used to distend the rectum. The usual vertical incision was made above the pubes. The calculus was quickly found and easily extracted. A T-shaped rubber tube was left in the bladder for four days. The wound healed by granulation, and at the end of four weeks all the urine was passed by the urethra.

The calculus was two inches in its long and three quarters of an inch in its short diameters, and consisted of calcium oxalate and earthy phosphates.

Case IV. *Papilloma of the Bladder; Suprapubic Cystotomy; Recovery; Death Two Months Later.*—P. M., aged forty-eight, male, was admitted November 16, 1889. Four weeks before, he had begun to have pain in the region of the bladder, accompanied by blood in the urine and increased frequency in micturition.

The urine contained a very large amount of blood, and at the time of operation it coagulated on standing.

Operation, November 16, 1889, Suprapubic Cystotomy.—The bladder was opened sufficiently to allow of digital examination.

Two or three cauliflower-like masses from an inch to two

inches in diameter were found attached to the mucous membrane. These were removed with scissors and Volkmann's spoon. The hæmorrhage, not profuse, was easily controlled.

The T-shaped rubber tube was left in the bladder eight days. The wound healed satisfactorily, but his general condition grew steadily worse.

Mild delirium developed in the third week. The temperature, respiration, and pulse remained normal throughout.

Physical examination showed the liver dullness markedly diminished and the lungs emphysematous. Although there was no longer hæmorrhage, he continued to grow weaker.

He was taken from the hospital a month after operation, against advice, and he died a month later.

There was no autopsy.

The pathologist's report showed the tumor to be a papilloma of the bladder.

Case V. *Carcinoma of the Testicle, complicated with Adherent Inguinal Hernia; Operation; Recovery; Rapid Recurrence.*—O. M., aged thirty-seven, born in the United States. His family history was free from malignant disease; he was admitted May 26, 1890. He had always been in good health and gave no evidence of specific history. Eighteen years ago he first noticed that the left testicle was larger than the right. The enlargement slowly but steadily increased up to three months previous to his admission, when it began to increase very rapidly. There was no pain until the last year, but intermittent shooting pain increasing in severity since. There was considerable loss of flesh (fifty pounds the last six years), but he was able to work until a month before his admission.

Examination showed the left scrotum occupied by a tumor, ovoid in shape, $7 \times 4\frac{1}{2}$ inches, and not extending into the inguinal canal. The skin was tense and the scrotal veins were enlarged. The consistence varied greatly, the tumor being soft and semi-fluctuating in portions and hard in others. The cord was slightly enlarged and tender. The inguinal glands were distinctly felt, but no tenderness was present. Rectal examination was negative.

Operation, May 27, 1890.—The tumor proved to be a neo-

plasm of the testicle with a small omental hernia in the upper portion. The omentum was firmly adherent to the tumor. The cord and omentum were ligated separately, but the omental vessels as well as the spermatic vessels were abnormally large and the ligature slipped after the stump had been sutured to the abdominal cavity, causing profuse hæmorrhage. The incision was carried upward, the abdomen was opened up, and the bleeding vessels were secured. A glass tube was left in the wound extending into the abdominal cavity to guard against further hæmorrhage, and a large iodoform drain was left in the lower end of the wound. On the third day there was some fresh hæmorrhage, but not enough to require opening up the abdominal wound. The glass tube was removed on the fifth day. The pulse was 120 to 144 during the first five days, but from that time it gradually returned to normal. The wound healed partly by granulation. At the time of his discharge, June 30th, a hard mass was distinctly felt in the left iliac region.

About six months later a large growth had appeared in the abdomen too extensive for removal.

B. Female.—Fourteen cases. (*a*) Laceration of the cervix uteri, four cases; laceration of the perinæum, two cases; prolapse of the uterus, vaginal hysterectomy, one case; carcinoma of the vaginal wall, one case; epithelioma of the vulva, one case; ulceration of the bladder, cystotomy, one case; epithelioma of the cervix uteri, one case; fungous endometritis, one case; recto-vaginal fistula, one case; carcinoma of the uterus (fundus and cervix), one case; fibroid of the uterus, submucous, one case.

Laceration of the Cervix (four cases).—Emmet's operation was employed, silver-wire sutures being used. The sutures were removed on the tenth day. Results all satisfactory.

Laceration of the Perinæum (two cases).—Tait's operation. Sutures of silkworm gut. Sutures removed at the end of two weeks. Good union.

Case I. *Prolapse of the Uterus; Vaginal Hysterectomy; Recovery.*—E. W., aged forty-six, admitted November, 1889. Her

general health was good. She had had six children, the last five years ago, since which time there had been a constant tendency to prolapse of the womb. She was unable to obtain relief from mechanical treatment, and her condition was gradually becoming more and more troublesome.

Examination showed the cervix low down, at the entrance to the vagina, and an ulcer of the size of a silver half-dollar upon the posterior lip. The uterine cavity was five inches and a half deep. An extensive laceration of the perinæum was likewise present.

Operation, November 18, 1889, Vaginal Hysterectomy.—Ether. The cervix was grasped with a volsella and drawn down. A sound was passed into the bladder and the cervix carefully dissected anteriorly, care being taken not to wound the bladder. Douglas's *cul-de-sac* was then opened and the peritonæum in front of the uterus and the broad ligament on either side were transfixed and ligatured with heavy silk, the ends of the ligatures being left long, so as to project from the vagina. The uterus was then cut free and removed. The hæmorrhage was slight and easily controlled; the vagina was packed with iodoform gauze.

Subsequent Progress.—She suffered only moderate shock from the operation. She was catheterized the first twenty-four hours and then passed urine voluntarily. The packing was partially removed the second day and fresh iodoform gauze was introduced. At the end of the first week she was given a warm douche of carbolic acid (1 to 80), and the packing was discontinued at the end of twelve days. She was up and dressed at the end of three weeks. Discharged cured, December 19, 1889.

Case II. *Carcinoma of the Vaginal Wall; Operation; Recovery.*—A. C., aged twenty one, admitted May 16, 1890, unmarried and never pregnant. Her general health had been good until two months previous to admission. She then began to have pain in the back, and a little later a foul-smelling, bloody discharge appeared in the vagina. This continued and became more profuse and the pain increased.

Examination showed the whole vagina filled with a soft granular mass, friable and moderately vascular. The cervix

could not be felt. There was an abundant foul discharge from the vagina.

Operation, May 21, 1890.—Ether. Sims's speculum was with difficulty introduced into the vagina. The vagina was found almost entirely filled with a fungous mass attached to the posterior and left lateral walls high up, but not in any way involving the cervix. The mass was removed with curved scissors and the base of attachment thoroughly scraped with a Volkmann spoon. The hæmorrhage was slight and easily controlled with an iodoform tampon.

Subsequent Progress.—The gauze was removed on the third day; a 1-to-80 carbolic-acid douche was given and fresh packing introduced. On the tenth day the base of the wound had almost entirely healed. There was no pain and scarcely any discharge.

The pathologist's examination showed the growth to be epithelioma.

Case III. *Endometritis; Curetting; Recovery.*—E. L., aged twenty-five, married, admitted December 27, 1890. She had had one child, two years and a half ago, with instrumental delivery and bad laceration of the cervix. A profuse leucorrhœal discharge had existed since.

Examination showed a transverse bilateral laceration of the cervix, together with an erosion of the anterior lip. The uterine cavity was of normal depth.

Operation, December 27, 1890.—Ether. The uterus was curetted with a sharp spoon, the cervix having been previously dilated. The discharge was much diminished, and on January 9th trachelorrhaphy was performed (Emmet's operation). The silver-wire sutures were removed on the ninth day. She was discharged, improved, January 22, 1890.

Case IV. *Rectovaginal Fistula; Operation; Recovery.*—A. M., thirty-seven years old, married, health good; admitted February 24, 1890. About three years and a half before, the patient had an abscess in the anterior wall of the rectum, which broke into the vagina and left a permanent opening, allowing of the escape of fæces.

Examination.—In the posterior vaginal wall about an inch

from the fourchette there was a sinus about three eighths of an inch in diameter leading directly into the rectum. The incisions were made precisely as in Tait's operation for lacerated perinæum. The sinus was cut out and the opening into the rectum closed with catgut sutures. The remaining sutures were of silkworm gut and applied in the usual way.

The patient was catheterized the first week, the legs were kept together, and on the sixteenth day the sutures were removed and the union was found complete. On the third week before she left the hospital the rectum was distended with fluid and the closure of the fistula was found to be perfect.

Case V. *Carcinoma of the Uterus; Curetting.*—J. G., aged fifty, widow, and family history good. Admitted April 23, 1890. She had had no children. Her general health had been good until six months previous to admission. The menopause had occurred three years before.

About six months ago (November, 1880) she began to have a dark-colored discharge from the vagina, and two months later she had attacks of pain in the left iliac region, at first dull in character, but afterward very sharp and severe. There had been no loss of flesh or strength. Examination showed an ulcer covering the entire surface of the cervix. The uterus was firmly fixed, and several hard nodular masses could be felt in the broad ligament.

April 27th.—She had an attack of excruciating pain, quickly followed by the discharge from the vagina of several drachms of purulent matter. The pain required large doses of morphine to control it. There was acute tenderness over the lower portion of the abdomen, most marked on the left side. The temperature was only slightly increased. The discharge lasted about two to three hours, and the tenderness quickly disappeared.

Operation, April 30, 1890.—Ether. Examination under ether showed that the cervix had almost entirely disappeared. The uterus was very firmly fixed, and the broad ligaments showed evidence of such extensive invasion that extirpation was not to be considered. The cervix and uterus were thoroughly curetted and the vagina was packed with iodoform

gauze. The operation was followed by slight improvement, but the pain continued moderately severe. Further operation not advised, and the patient left the hospital, May 7, 1890.

Case VI. *Carcinoma of the Uterus; Curetting; Marked Temporary Improvement.*—E. C., aged fifty-two, married, admitted November 30, 1889. Family history: Five relatives of the patient had died of carcinoma. She had had three miscarriages, the last twenty-six years previous to admission. Two years ago she began to have severe uterine hæmorrhage. This recurred at intervals, and of late became more profuse and occurred at shorter intervals. There had been some pain in the region of the uterus for several months. All the symptoms were progressive, and there was considerable loss of flesh and strength. Examination showed the cervix entirely gone and in its place a fungous mass, the surface of which was broken down and ulcerated.

Operation, November 30, 1889.—Ether. Careful examination showed the growth to involve the bladder so extensively that hysterectomy was deemed unwise. As much of the tumor as possible was removed with a sharp curette, and the vagina was packed with iodoform gauze. The patient was considerably improved by the palliative operation. The discharge very much lessened, and she left the hospital at the end of two weeks. She is still living (June, 1891), having had one curetting since the one described.

Case VII. *Ulceration of the Bladder; Cystotomy; Recovery.*—C. H., aged twenty-eight, female, admitted May 10, 1890. She had had symptoms of severe irritation of the bladder during eight months previous to admission. There were blood and pus in the urine, and occasionally there was a small amount of sand-like material. There was very severe pain during micturition, and lasting some time after. Examination with a sound was very painful and unsatisfactory. Thorough lavage treatment had been tried previous to her entrance into the hospital.

Operation, May 21, 1890.—An incision large enough to admit the index finger was made in the vesico-vaginal septum, and the bladder carefully explored. A portion of the mucous membrane was covered with fine sand-like deposits of calcareous

matter, and in one place there was a small area of ulceration. The calcareous matter was scraped away with a sharp spoon, and the bladder thoroughly irrigated with warm boric-acid solution. The urethra was then dilated with a No. 40 steel sound. The wound in the bladder healed very promptly, but the pain was not much relieved by the operation. The urine improved, and the frequency of micturition diminished. She was discharged, improved, July 7, 1890.

Case VIII. *Epithelioma of the Vulva; Excision; Recovery.*—H. M., aged fifty-two, admitted May 21, 1890, married. Her general health was always good. Her family history was negative. About a year and a half ago she first noticed a small ulcer on the left labium. This had very slowly increased in size, but had never been painful. Examination showed on the left labium minus a superficial ulcer about an inch in diameter. The surface was covered with grayish, unhealthy granulations, but the edges were neither indurated nor undermined. There were no enlarged glands present. A small section was removed for microscopical examination, and was pronounced epithelioma by the pathologist.

Operation, May 27, 1890.—An elliptical incision was made, including the ulcer, about a quarter of an inch of healthy tissue on either side, and the mucous membrane. Primary union and prompt recovery followed.

UPPER EXTREMITIES.

Fractures and Dislocations.—Ten cases; ten recoveries.

Case I. *Compound Comminuted Fracture of the Radius; Rupture of the Superficial Flexor Muscles; Suture; Recovery, with Restoration of Function.*—J. H., aged forty-seven, male, was admitted April 26, 1890. A heavy bar of iron had fallen upon his left forearm, causing a large lacerated wound just below the middle, and fracturing the radius in three places. The superficial flexor muscles were nearly severed. The wound was very thoroughly cleansed with 1-to 1,000 solution of bichloride of mercury, and the muscles were sutured with catgut. The arm was put up in an antiseptic dressing with a plaster splint exter-

nally. There was no reaction whatever, and the wound was not dressed until the eighth day. It had entirely healed by primary union. The patient was seen six months later, and he had almost entirely regained the use of the flexor muscles.

Case II. *Amputation of the Arm for Crush of the Elbow.*—B. F., aged thirty-two, male, admitted May 21, 1890. His right elbow had been caught between a heavy iron tank and a beam, causing a compound fracture into the elbow joint, with severe crushing of the soft parts above and below. The hand was cold, and neither radial nor ulnar artery could be felt.

Operation two hours after the injury. Amputation at the middle of the arm. Two small rubber drainage-tubes were used, and taken out on the third day. Primary union followed.

Case III. *Amputation of the Forearm for Traumatism.*—J. H., aged thirty-three, male, entered the hospital May 27, 1890. His right hand and forearm had just been caught in a planing machine. The hand and lower half of the forearm were absent, and the muscles were lacerated and contused for some distance above, and covered with sawdust and shavings. The hæmorrhage had nearly ceased. Amputation was performed three inches and a half below the elbow, eighteen hours after the injury. Primary union followed.

Case IV. *Wiring of an Ununited Fracture of the Clavicle.*—J. G., aged twenty-nine, male, admitted September 12, 1889. The patient, a strong, well-developed man, had fallen from a truck June 7, 1889, striking upon his right shoulder and fracturing the clavicle at about the middle point. The arm was immobilized for four weeks, but when the apparatus was removed no union had taken place. On his entrance into the hospital, examination showed an overlapping of an inch and a half, but, on drawing the shoulder firmly back, this could be reduced to half an inch. Abduction and rotation were entirely lost, and only slight backward and forward motion remained.

Operation, September 16, 1890.—An incision three inches long was made over the middle of the clavicle and the ends of the fragments were exposed. An adventitious bursa was found where the ends overlapped. The two ends were made even with a bone forceps, and after half an inch had been re-

moved they were easily brought into apposition, and then held in place by means of a strong silver-wire suture. A small drainage-tube was left in the wound He left the hospital October 14th, the bone having united firmly.

Case V. *Amputation at the Wrist for a Crush of the Hand.*—M. H., aged twenty-four, female, admitted April 8, 1890. The patient's left hand had been drawn between the rollers of a steam mangle, and the whole hand from the fingers to the middle of the metacarpal bones was flattened and discolored. The hand was cold and the circulation was almost entirely absent. The patient was given ether and very free incisions were made over the palmar and dorsal surfaces, allowing of the escape of a large amount of dark bloody serum. The hand was then put up in a heavy iodoform dressing, and constant irrigation with 1-to-5,000 bichloride-of-mercury solution kept up for eight days. At the end of that time a well-defined line of demarkation had formed.

Second Operation, April 19th.—The tissues of the dorsal side of the hand were dead and all the fingers gangrenous, but incisions showed considerable vitality still in the palm. All the fingers were removed at the metacarpo-phalangeal articulation. There was no inflammatory reaction at any time. At the end of a week the dorsal slough had almost entirely separated, leaving a clean granulating ulcer, which it was intended to cover with skin grafts, but the patient preferred losing the rest of the hand to the necessary delay in healing, and accordingly amputation at the wrist was performed on May 7, 1890. She made a good recovery.

Case VI. *Excision of the Elbow for Ankylosis.*—B. P., aged nineteen, male, admitted October 22, 1889. He was well developed and his general health was excellent. A year previous to admission he had fallen upon the ice, striking upon his right elbow. He was at first told that his arm was broken, and then that it was dislocated backward at the elbow. It was put up in a splint at less than a right angle and left for four weeks. When the splint was taken off, motion of the joint, particularly flexion, became more and more painful, and the arm was kept extended until mobility was almost entirely lost. At the time of his entrance into the hospital there was almost complete

FIG. 8.—Congenital angeioma of left forearm and fingers.
Lipogenous angeioma of back.

ankylosis, with evident signs of an old dislocation of the ulna and radius backward. There was no tenderness, and only slight atrophy of muscles.

Operation, October 30, 1889.—An incision three inches long was made over the elbow joint posteriorly, just to the inside of the external condyle. The head of the radius and the olecranon process of the ulna were removed with the chisel. They were both displaced backward. The articular end of the humerus having been freed, there were found unmistakable signs of an old T-shaped fracture into the joint. The condyles were enlarged and separated, and there had been a considerable formation of new bone between. Two rubber drainage-tubes were left in the wound and the arm was put up at right angles with a heavy antiseptic dressing, with a plaster splint externally.

Subsequent Treatment.—The wound was dressed at the end of twenty-four hours on account of a bloody discharge. The second dressing was on the seventh day. There was no discharge and the wound healed by first intention. At the end of three weeks the arm was put up at an angle of 70°, and three weeks later passive motion was begun. He was seen several months after the operation and then had a very useful joint.

Case VII. *Dislocation at a Metacarpo-phalangeal Articulation; Operation.*—P. B., aged twenty-four, male, admitted October 15, 1889. The capsular ligament was so tightly "button-holed" over the head of the metacarpal bone that reduction without incision was impossible. A small incision was made and the ligament grasped with a tenaculum, and reduction was easily made.

Case VIII. *Compound Comminuted Fracture of Humerus; Operation; Subsequent Wiring; Recovery.*

(*b*) NEOPLASMS.

Case I. *Congenital Angeiomata of the Left Forearm and Fingers, with a Large Lipogenous Angeioma of Back; Operation; Recovery.*—A. A., nineteen years of age, female, admitted April 2, 1890. Her general health had always been good. The

FIG. 9.—The same.

midscapular region was occupied by a tumor of the size of a cocoa-nut, regular in outline, and soft and almost fluctuating in consistence. The skin was perfectly normal and adherent to the tumor. On the extensor surface of the left forearm was a tumor of about the size of a hen's egg. The skin was of a bluish color and the tumor was attached to the fascia of the muscles and plainly angeiomatous in character. Upon the dorsal side of the first, second, and fourth fingers of the left hand, over the middle phalanges, were small nodes of about the size of a small chestnut. These were firmer in consistence than either of the other tumors, and were attached to both the skin and the deeper parts.

Operation, April 9, 1890.—The tumor of the back was removed by a large crucial incision. The tumor was mostly composed of fat, but was much more vascular than an ordinary lipoma. The tumors of the fingers could not be enucleated and were very firmly adherent to the skin and tendons. The hæmorrhage was profuse. The wounds healed promptly and she left the hospital April 29th, to return for an operation upon the arm.

Case II. *Epithelioma of the Arm (Recurrent); Operation; Recovery.*—W. L., aged forty-two, male; admitted September 14, 1889. Two years previously a small tumor had been removed from between the thumb and index finger of the left hand. Four weeks before admission a small swelling appeared on the inner side of the left elbow. There was slight pain.

Operation, September 14, 1889.—The tumor was of about the size of a hen's egg and closely adherent to the triceps muscle. It was carefully dissected out, and prompt healing of the wound followed.

The pathologist's report showed the tumor to be epithelioma.

(*c*) TUBERCULAR DISEASE.

Case I. *Excision of the Elbow for Tubercular Arthritis.*—W. P., aged thirty-eight, female, French; admitted May 3, 1890. No tubercular family or previous personal history. Two years ago she injured her left elbow. Since that time there had been

a slight loss of mobility. During the two months previous the pain and swelling had markedly increased, and she had been unable to use the joint. At the time of her entrance into the hospital examination showed marked swelling of left elbow joint, great tenderness on pressure, and the forearm fixed at an angle of 120°, with considerable limitation of pronation and supination. There was one inch enlargement at the olecranon process and one inch atrophy at the middle of the arm. Her general health was good, and there was no evidence of tubercular disease in the lungs.

Operation, May 7, 1890.—Ether. An incision four inches long was made over the olecranon process, and an abscess cavity, which communicated with the joint and was filled with broken-down caseous pus, was opened. The articular ends of both radius and ulna, as well as the lower end of the humerus, were so badly diseased that excision was performed. The arm was put up at right angles with a dry sterilized dressing, and immobilized by means of plaster of Paris externally. The wound healed by perfect primary union, and the result was very good. Passive motion was begun at the end of a month.

Case II. *Tubercular Arthritis of the Elbow; Amputation; Recovery.*—L. M., aged sixty, male. His family history was negative. He had had signs of tubercular arthritis of the elbow for four years. Two months ago—July, 1889—resection of the joint was performed at the New York Hospital. The result was unsatisfactory and amputation was advised and performed September 7, 1889. The section of the humerus was at the junction of the middle and lower thirds. The lower end of the humerus was thickened and diseased, and the soft parts contained several sinuses leading to bare bone. Primary union followed the operation.

Case III. *Tubercular Osteitis of the Clavicle simulating Malignant Disease; Operation; Recovery.*—J. L., aged forty-three, male; admitted October 14, 1889. There was no tubercular family or previous personal history. There was a very doubtful specific history. Three months before, while picking up a heavy weight, he felt a sudden pain in the sternal end of the left clavicle. He soon after noticed a smooth, hard swelling in this

region. He thought it had increased slowly in size. The pain nearly disappeared and the functions of the arm remained good until the day previous to his entrance into the hospital, when, in the act of putting on his coat, he felt something give way in the region of the swelling, and he was unable to move his arm afterward.

Examination showed a hard, fusiform swelling over the sternal end of the left clavicle of about the size of a small hen's egg. The skin over it was normal and not adherent. There was no tenderness on pressure.

Operation, October 26, 1889.—Ether. An incision two inches and a half long was made over the swelling. A small area of cheesy degeneration was found in the clavicle, and a small portion of necrosed bone was entirely separated from the living bone. The cavity was thoroughly curetted and packed with iodoform gauze. The wound healed slowly, but a second curetting was done a few months later.

Case IV. *Amputation of the Arm for Tubercular Osteitis.*—V. T., aged twenty-two, male; born in Italy. His family history was obscure. He had fallen and injured the right elbow seven years before. The arm became swollen and painful and the functions of the elbow joint more and more impaired. Sinuses appeared and three years later the joint was resected at Charity Hospital. The sinuses persisted and discharged freely. He entered the hospital November 2, 1889. The lower portion of the arm was swollen and reddened, and contained six sinuses varying in size and communicating with bare bone. On the posterior portion, near the elbow, was a large sloughing ulcer of the size of a silver dollar, with deeply undermined edges.

Operation, November 2, 1889.—The arm was amputated just above the middle. The drainage-tubes were taken out on the third day. The wound healed by first intention.

Case V. *Tenosynovitis of the Extensor Tendons of the Hand (Tubercular); Operation; Incision and Curetting; Recovery.*

Case VI. *Tenosynovitis of the Flexor Tendon of the Index Finger (Tubercular); Incision and Dissecting Out of the Tubercular Sac; Recovery.*

Cases VII and VIII. *Caries of the Radius; Incision and Removal of Diseased Bone; Recovery.*

Case IX. *Caries of the Ankle; Incision and Curetting; Recovery.*

(*d*) inflammatory.

Case I. *Osteitis of the Humerus; Drilling; Partial Section of the Musculo-spiral Nerve; Immediate Suture.*—J. O. C., forty-five years of age; admitted October 14, 1889. Family history good. General health always good and no specific history. Five years previous to admission, without apparent cause, he began to have severe pain in the outer portion of the right arm. The pain was deep-seated, and very quickly the arm began to swell. The swelling gradually extended downward until the upper portion of the forearm became involved and motion at the elbow was greatly limited and very painful. The swelling appeared to be deep-seated and at no time did the skin become reddened. This condition remained about two or three weeks, and then the swelling and induration gradually disappeared, the arm regaining its normal appearance and functions at the end of five or six weeks. A similar attack to the one just described recurred once every year up to the time of his entrance into the hospital. On two or three occasions a soft spot appeared in the swollen area and subsequently broke, discharging for a short time a purulent fluid. The last attack began August 18, 1889, and at the time of his entrance into the hospital he said it was just beginning to subside. Examination showed the right arm and the upper portion of the forearm symmetrically enlarged, the forearm resting in a semiflexed position and allowing of only a limited amount of motion (about 30°). The skin was not reddened and only slight tenderness was present. The outlines of the muscles were distinct, and over the lower two thirds of the arm there was well-marked induration of the soft parts, giving almost a bony feel.

He remained in the hospital a week before an operation was performed. The induration slowly diminished and muscular power increased.

Operation, October 21, 1889.—Ether. An incision four inches

FIG. 10.—Malunion of femur (Case I, before operation).

long was made on the outer side of the right arm and carried down to the bone. On raising the periosteum, several small scales of new bone were brought into view. The humerus at the middle seemed normal, but the lower third was enlarged, very much harder than normal bone, and almost like ivory in appearance. Twelve small holes were made in the humerus by means of a drill and the wound was packed with iodoform gauze. During the operation the musculo-spiral nerve was partially cut, it being imbedded in cicatricial tissue. The sheath was sutured with catgut. He had complete musculo-spiral paralysis, which persisted for several weeks. The wound healed promptly by granulation. When he left the hospital (December 24th) the paralysis was slowly but steadily diminishing under treatment by electricity.

Case II. *Cicatricial Contraction of a Finger.*

Case III. *Syphilitic Necrosis of the Scapula.*

Case IV. *Cellulitis of the Hand.*

Case VI. *Paronychia of the Index Finger simulating Epithelioma; Amputation of the Finger.*

LOWER EXTREMITIES.

(*a*) FRACTURES AND DISLOCATIONS.

Case I. *Resection of the Femur for Malunion; Recovery.*—H. H., male, aged thirty, admitted September 24, 1889. He had received a fracture of the left femur three months previously by direct violence. At the time of admission into the hospital there was two inches and a half of shortening of the left leg. Near the junction of the middle and lower thirds of the left femur were well-marked signs of an old fracture, with considerable deformity and evident overlapping of the fragments. The union was not perfectly firm, and he was unable to walk without the aid of crutches.

Operation, October 5, 1889.—Ether. An incision four inches long was made over the outer aspect of the thigh, in the region of the fracture. On exposing the bone the two fragments were found overlapping about two inches and a half, the lower fragment projecting upward and outward, and the upper

vice versa. There had been a considerable growth of new bone about the ends of the fragments, which held these fragments together with moderate firmness. The new bone was chiseled away sufficiently to allow of a forcible separation of the fragments, but the ends could not be brought into apposition until about an inch and a half to two inches had been removed from each. Good position having been secured, the leg and thigh and pelvis were immobilized by means of a heavy plaster splint. The wound was not dressed until the end of three weeks, and then through a fenestra cut in the splint. It was found nearly healed.

November 22d.—A new splint was applied. The position was good, and union fairly firm. He went about on crutches, and on January 2d the splint was discontinued, with the exception of two short side-splints, fitted to the thigh, which he wore during the day and left off at night. There was two inches of shortening, but the union was getting firmer every day.

Case II. *Osteoclasty for Malunion of the Femur.*—R. C., aged three, female, admitted September 28, 1889, suffering from fracture of the left femur at the junction of the middle and upper thirds. She was treated by vertical extension for ten days, and then a plaster splint from foot to pelvis was applied. The splint was removed on November 12th, and there was found considerable anterior bowing and half an inch shortening. She was given ether on November 14th, and the femur refractured, straightened, and put up in coaptation splints, and a plaster spica and light extension were applied. The splint was taken off on December 5th. There was firm union. There was no deformity and only an eighth of an inch shortening. Discharged cured December 7, 1890.

Case III. *Compound Fracture of the Os Calcis with Rupture of the Tendo Achillis; Suture.*—J. G., male, aged forty-five, admitted April 24, 1890, with the following history: While he was standing in an elevator his right foot was caught between the elevator and the shaft and badly crushed. Examination showed a large lacerated wound over the lower portion of the right tendo Achillis, with parts of ruptured tendon projecting from the wound. Ether was given, and an operation at once

performed by Dr. Schouffler. A longitudinal incision three inches long was made over the os calcis, and the lower portion of the ruptured tendon was found attached to a fragment of the os calcis about three quarters of an inch in diameter. This,

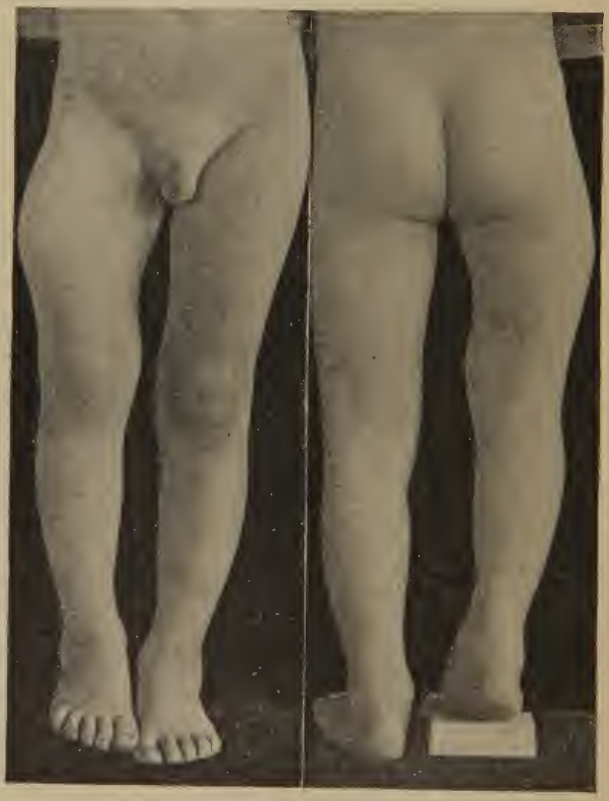

FIG. 11.—Malunion of femur (F. E.) (Case IV, before operation).

with several smaller pieces, was removed, and the upper end of the tendon brought down and sutured to the soft parts about

the base of the os calcis and to the small portion of tendon still attached to that bone. The foot was put up in a plaster splint in a position of extreme flexion. A portion of the tendo Achillis sloughed off and somewhat delayed recovery. The result was good.

Case IV. *Osteoclasty for Malunion of the Femur.*—F. E., aged four, admitted June 6, 1890. He had fallen four months previously, causing a fracture of the right femur at about the middle point. At the time of his admission the union was fairly firm, but there was well-marked deformity at the site of the old fracture, the two fragments forming an angle of 150°. There was a shortening of an inch and a half.

Operation, June 6, 1890.—Ether was given, and the femur refractured at the same point as the original break, and then the fragments were brought into apposition by traction. Coaptation splints were applied to the thigh and the leg was put up in Buck's extension apparatus, with five pounds weight; the extension was left on for two weeks and then taken off and a plaster-of-Paris spica applied. This was removed at the end of ten days. There was good union, with no deformity, and only an eighth of an inch shortening.

(*b*) NEOPLASMS.

Case I. *Sarcoma of the Lower End of the Femur; Amputation of Thigh.*—C. F., aged twenty-nine, male, admitted November 26, 1889. General health good until recently. About a year previous to his admission he noticed a slight swelling of the right knee, and complete flexion became more and more painful. There was no history of traumatism. The swelling increased in size, slowly at first, but more rapidly for the last five months. He was unable to walk without crutches, and examination showed the right leg partially flexed (angle 150°), the knee greatly enlarged, and the bony outlines lost; the skin abnormally dark and the superficial veins enlarged. The bony enlargement seemed chiefly confined to the lower end of the femur, and the internal condyle was more prominent than the external and showed areas of softening. It was tender on pressure and gave a crackling sensation. The circumference at

mid-patella showed an enlargement of two inches. There was slight atrophy of the museles of the thigh and there was slight glandular enlargement in the groin.

Operation, November 30, 1889.—Ether. Amputation was performed just below the middle of the thigh. Rubber and glass drainage-tubes were used, and a wet bichloride dressing (1 to 5,000) was applied. The tubes were taken out on the fourth day. The wound healed by first intention, and he was discharged cured December 21, 1889.

Pathologist's report.—Round- and spindle-eelled sareoma.

Case II. *Lipomata of the Thighs; Excision.*

Case III. *Hygroma of the Knee; Excision.*

Case IV. *Floating Cartilage of the Knee Joint.*—The patient, twenty years of age, male, had had a mild attaek of acute synovitis of the knee two months previously. The "eartilage" was removed under eocaine, and was of about the size of a bean. The wound healed promptly and he was up and about at the end of a week.

Case V. *Plexiform Angeioma of the Thigh; Excision; Recovery.*

(*c*) TUBERCULAR DISEASE.

Case I. *Tubercular Synovitis of the Knee; Arthrotomy; Recovery.*—T. G., aged twenty months, female, born in Italy, was admitted February 25, 1890. Her parents were well and there had been no injury to the knee. Ten months before her admission the knee began to swell, and on three oecasions it was lanced, leaving permanent sinuses.

Operation, March 1, 1890.—The knee was greatly swollen (three inehes and a quarter larger than the other knee) and there was marked redness and tenderness. The movements of the joint were very limited and painful. Two longitudinal ineisions were made—one on either side of the patella—opening the joint. The synovial membrane was found in a state of advaneed tubercular disease, and was removed. The artieular ends of the bones did not seem to be involved. The joint was diseased. Reeovery was very slow, and a subsequent relapse after leaving the hospital made a resection neeessary.

Case II. *Amputation of the Thigh for Tubercular Arthritis of the Knee.*—G. R., aged forty-seven, male, admitted February 6, 1890. His health was poor and there was evidence of a tubercular deposit in the apex of one lung. Two years previously he had received a slight injury to the left knee. Since that time there had been a gradually increasing enlargement, accompanied by pain and tenderness with impairment of the functions of the joint. He had been unable to walk for the past six months. At the time of his entrance into the hospital the left knee was enlarged one inch at the middle of the patella, and there was an atrophy of two inches at the middle of the thigh. The condyles were thickened and there was slight lateral motion with localized points of tenderness over the condyles. Mobility was almost entirely gone, the leg being fixed at an angle of about 150°. There was hardly any fluctuation and the patella was slightly movable.

Operation, February 15, 1890.—A transverse incision was made just below the patella, opening the joint. The lower end of the femur, the patella, and the articular end of the tibia were all so badly diseased that excision was deemed impracticable, and amputation was at once performed. The section of the femur was made about three inches above the condyles. The drainage-tubes were removed on the fourth day. The wound healed primarily and he was up at the end of ten days. The pathologist's report showed a typical tubercular joint.

Case III. *Tubercular Arthritis of the Knee; Amputation; Recovery.*—E. W., aged thirty-eight, male, was admitted April 10, 1890. He had had chronic inflammation of the right knee for twenty-nine years, with an acute exacerbation following an injury three months previous to his admission. His general health had never been good, and he had chronic epilepsy. Signs of tubercular deposits were found at both apices. The affected knee showed an enlargement of three inches and a half, with flexion limited to 31°. There was also marked atrophy of the muscles of the thigh. In consideration of his poor general condition, amputation was chosen in preference to resection.

Operation, April 15, 1891.—The section was made just above the condyles. The wound healed by first intention.

The examination of the knee showed well-advanced tubercular disease.

Case IV. *Tubercular Osteitis of the Tarsus; Incision and Curetting.*—A. D., aged six, male, Italian, admitted November 18, 1889. Three months before, following an injury, his left foot began to swell and become painful. It was opened and a sinus persisted, which at the time of operation communicated with bare bone. A two-and-a-half-inch incision was made (November 30th) and the granulations were thoroughly curetted. (The tarsus was subsequently excised, December 30th, by Dr. Weir.)

Case V. *Synovitis of the Knee (Chronic Tubercular); Irrigation of the Joint; Improvement.*—H. B., male, adult. He had a chronic synovitis of the right knee with a large effusion. The knee was first made aseptic and the fluid withdrawn by means of a trocar, and then distended with a 1-to-30 solution of carbolic acid. The washing was continued until the fluid came away clear, and then the leg was immobilized in a close-fitting plaster splint which was left on for a week. The pain was considerable for the first twenty-four hours, but was slight thereafter. Marked improvement resulted, but a few months later he returned with a slight recurrence of the effusion, and a second washing was made with further improvement.

Case VI. *Osteitis of the Femur; Incision and Chiseling; Improvement.*

Case VII. *Excision of the Ankle for Tubercular Arthritis.*—M. S., aged thirty, female, admitted June 11, 1891. She had had pain in the left ankle for fifteen months. Swelling soon developed with limitation of motion. At the time of the operation there was a thickening of an inch and a half.

Operation, June 14, 1890.—Excision. She made a good recovery.

The pathologist's report showed tuberculosis of the tarsus.

Case VIII. *Tubercular Arthritis of the Hip; Cold Abscesses; Incision.*

Case IX. *Arthritis of the Knee (Tubercular); Amputation; Recovery.*—E. F., aged thirteen, admitted October 22, 1889. She had been in good health until three years before, when she

was kicked in the knee by another child. Pain and swelling followed. The symptoms increased in severity slowly, and the joint movements became more and more limited. Three months before her admission an incision was made over the swelling and the sinus failed to close. There was three inches enlargement at the patella of the affected knee, with marked atrophy of the muscles of the thigh. Distinct fluctuation was also found over the joint.

Operation, November 9, 1889.—The incision was so planned that a resection could be done in case it was desired, but the disease was found so far advanced that amputation was thought preferable. The section of the femur was made just above the condyles. Prompt recovery followed.

Microscopical examination failed to show the presence of tubercles.

(*d*) INFLAMMATORY.

These, twenty-six in number, were as follows :

CASE I. *Suppurative Arthritis of the Knee (following Subcutaneous Suture of the Patella).*—The patient, a male, aged thirty, fractured his right patella on August 10, 1890. Subcutaneous suture with silk was done on the same day. At the end of ten days the dressing was removed and the swelling had entirely subsided; a plaster splint was applied, and on the twelfth day he was allowed to go home. The knee became very painful during the first night, and two days later he returned to the hospital. The knee was badly swollen, and the temperature was high. The openings where the suture had been introduced were enlarged, and considerable pus escaped. Drainage-tubes were inserted and frequent irrigation was employed. The temperature continued to rise and the inflammation to extend in spite of the free incisions. He came under Dr. Bull's care on August 28th. On August 30th he was given ether and the joint was drained from below. His condition was extremely critical for nearly a week, the temperature ranging from 103° to 105°. Recovery finally took place.

CASES II, III, IV, V. *Necrosis of the Tibia.*

CASES VI TO XVIII. *Inguinal Adenitis; Removal of the Enlarged Glands, either by Dissection or Curetting.*

Case XIX. *Femoral Adenitis.*

Case XX. *Cold Abscess of the Thigh; Incision and Drainage.*

Case XXI. *Ulcer of the Leg; Skin Transplanting.*

Case XXII. *Senile Gangrene of the Foot and Leg; Amputation of the Thigh; Death.*—The patient, a man, aged seventy, had gangrene of the right foot and leg extending nearly to the knee. He had well-marked general atheroma of the arteries, and his condition was very poor. The thigh was amputated in the upper third. The flaps became gangrenous during the second week, and he died from exhaustion two weeks after the operation.

Cases XXIII and XXIV. *Osteitis of the Tibia.*

Case XXV. *Excision of the Metatarso-phalangeal Articulation for Hallux Valgus.*

Case XXVI. *Necrosis of the Femur; Chiseling.*

MISCELLANEOUS.

Case I. *Genu Valgum et Varum; Double Osteotomy; Recovery.*

Case II. *Lipoma of the Back; Excision.*

Cases III and IV. *Varicose Vein of the Leg; Incision and Resection.*

Case V. *Sinus of the Buttock (Tubercular ?).*

Case VI. *Lumbar Abscess.*

Case VII. *Congenital Web Fingers.*

Case VIII. *Multiple Abscesses of the Leg, Thigh, and Back.*

In addition to the operative cases there were sixteen fractures of the femur treated during the same time. Of these, an unusually large number (five) were multiple fractures. Three were compound, and one, already described elsewhere, was complicated with an unrecognized fracture of the twelfth dorsal vertebra. The patient died on the twelfth day, from intestinal obstruction caused by paresis. In two others there was traumatic delirium, which quickly proved fatal, and in a fourth, which was a very bad compound fracture (treated conservatively at first, then by amputation), the patient died of septicæmia.

The general plan of treatment adopted was early reduction, under ether, with the fragments kept in apposition by means of Buck's extension apparatus and coaptation splints at the site of the fracture. The extension was kept on from six to eight weeks.

In a few cases, mostly in children, the leg and thigh were put up under ether, and extension made in a firm plaster splint reaching from the toes to the crest of the ilium and incasing the whole pelvis. Heavy extension was left on until the splint had thoroughly hardened. This was left on for two weeks, and a second splint applied.

The results obtained were very satisfactory. Vertical extension (both legs) was employed in one case, in a child eight months of age. The result was no deformity and no shortening.

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